Tennessee Underground Storage Tank Owner Compliance Manual

Tennessee Department of Environment & Conservation
Division of Underground Storage Tanks
in partnership with the
Environmental Protection Agency

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Tennessee Division of Underground Storage Tanks
Tank Owner Compliance Manual

Contents

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Chapter 1: Does This Manual Apply To Your Facility?

This manual is designed to help owners and operators of underground storage tanks comply with Tennessee Petroleum Underground Storage Tank regulations. These tanks, along with any connected underground piping, are called USTs in this manual. The manual uses the term tank when the underground tank is the only thing being discussed. This manual describes requirements and best management practices (BMPs) for your USTs and helps you determine whether they are in compliance with the law.

- **If you have underground storage tanks at your facility that meet the criteria described below, this manual applies to you.**
- **After reading this section, you may determine that the manual does not apply to you.**

To determine if this manual applies to you, read and answer the following questions:

Question 1. Do you have any USTs at your facility?	**Yes**	**No**
An underground storage tank or UST is an: ➢ Underground tank and underground piping. ➢ Underground tank and *aboveground piping* **(if at least 10% of the total volume of the tank and piping are underground).** ➢ Aboveground tank and underground piping **(if at least 10% of the total volume of the tank and piping are underground).** This scenario is not common. An underground storage tank is **not** an aboveground tank and aboveground piping.		
❖ **If you answered yes,** continue to Question 2. ❖ **If you answered no,** this manual does not apply to you.		

Question 2. How many USTs at your facility meet at least one of the following criteria? These are types of USTs that are covered by this manual.	**Number Of USTs**
➢ Contain petroleum or used oil (that will be recycled) at public gasoline stations or repair shops. ➢ Contain heating oil that is **not** used (or consumed) on the premises where it is stored. ➢ Are farm or residential motor fuel tanks greater than 1,100 gallons used for noncommercial purposes. ➢ Are petroleum tanks owned by a federal, state, or local entity. ➢ Are private petroleum tanks used for fueling of business vehicles. ➢ Contain a hazardous substance listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). An example of a hazardous substance is antifreeze. Contact the Division if you are not sure if you have a hazardous substance tank. ➢ Store product for use by emergency power generators.	
❖ **If you have at least one UST that meets the criteria above,** continue to Question 3. ❖ **If you have no USTs that meet the criteria above,** you do not have any USTs covered by the Tennessee Petroleum Underground Storage Tank rules. This manual does not apply to you.	

Question 3. Of the number of USTs you identified in Question 2, how many meet at least one of the following criteria? USTs that meet at least one of the criteria below are not covered by this manual.	**Number of USTs**
USTs are not included in this manual if they meet one of the following: ➢ Total tank and piping volume is 110 gallons or less. ➢ UST with a tank that was constructed or built in the field (field-constructed). ➢ Tank situated in an underground area, but situated on or above the surface of the floor. ➢ Heating oil tank that is used (or consumed) on the premises where it is stored. ➢ Hazardous waste tank (in general, a hazardous waste is a hazardous chemical that cannot be reused in some way). ➢ Tank containing radioactive materials. ➢ Flow-through process tank (a tank that forms an integral part of a production process where there is a steady, variable, recurring, or intermittent flow). ➢ Airport hydrant fuel distribution system. ➢ Tank located at pipeline facility regulated under the Natural Gas Pipeline Safety Act of 1968 or the Hazardous Liquid Pipeline Safety Act of 1979 [or an intrastate pipeline facility regulated under comparable state laws]. ➢ Tank that is a part of machinery that contains product for operational purposes such as a hydraulic lift tank or electrical equipment tank. ➢ Emergency spill or overflow containment tank that is quickly emptied after use. ➢ Tank located at a nuclear power generation facility used for an emergency power generator.	
❖ **If you have no USTs that meet the criteria in Question 3,** this manual applies to you. Begin using this manual by reading Chapter 2. ❖ **If you have at least one UST that meets the criteria in Question 3,** continue to Question 4.	

Question 4. What is the difference between the total number of USTs in Question 2 and Question 3?	
A. Insert the number of tanks from Question #2 above:	
B. Insert the number of tanks from Question #3 above:	
Subtract B from A and Insert:	
❖ **If the difference between Question 2 and Question 3 is "1 or greater,"** this manual applies to you. Begin using the manual by reading Chapter 2. ❖ **If the difference between Question 2 and Question 3 is "zero,"** you do not have any USTs covered by the Tennessee Petroleum Underground Storage Tank rules. This manual does not apply to you.	

Chapter 2: Introduction

What Is The Purpose Of This Manual?

This manual is designed to:

- Help explain Tennessee's environmental, record keeping, and operation and maintenance requirements for USTs,
- Explain and suggest best management practices and voluntary actions that you can take to improve environmental performance and reduce financial risk regarding your USTs and
- Help owners and operators of regulated USTs determine if they are in compliance with existing Tennessee UST regulations.

How does using this Manual benefit you, help maintain the environment and benefit the public?

- This manual will help you understand the Tennessee requirements and suggest best management practices you can use and help you determine the compliance status for USTs at your facility.
- You are helping to protect **public health and the environment.** Releases from USTs – spills, overfills, leaking tanks and piping can contaminate groundwater. Your local community may depend on that groundwater as a source of drinking water. In addition, leaks from USTs can result in fires or explosions, which threaten public safety.
- You are protecting your **economic investment**. It is important to quickly detect, report, and clean up releases, as required by the UST regulations. Preventing releases protects your real estate investment. Any product that is lost in a release will cost you in costs to clean up contamination, potential penalties, business down time, lost revenue of product not sold, and affect the resale value of your property. By responding quickly and containing a release, you may be able to reduce cleanup costs and environmental damage.
- You are required to follow environmental laws by complying with UST regulations. If you are the owner or operator of one or more USTs, you are legally responsible for preventing and quickly detecting releases from your USTs. You are also responsible for reporting and cleaning up any releases that occur. You will be held accountable if your UST leaks. Therefore, you should make sure releases do not occur.

This document is not a substitute for Tennessee law and regulations, nor is it a law or regulation itself. For a comprehensive and complete understanding of the law and regulations, please refer to Tennessee Petroleum Underground Storage Tank Act T.C.A. 68-215-101 and the Rules, Chapter 1200-1-15. These documents can be accessed from the Division website: www.tdec.org/ust

This publication was compiled and written by Michelle Pruett, with the assistance of Lamar Bradley. If you have questions about the contents of this publication or need additional information, please refer to the Division website, or call the Underground Storage Tank Field Office nearest you by dialing 1-888-891-TDEC.

Chapter 3: How To Use This Manual

Symbols

You will see symbols next to some parts of this Manual.
The symbols are used to highlight key information.
Below are the symbols and the meaning of each.

Important Steps

- This symbol will guide you to important steps to follow for each section.

✓

Best Management Practice

- What you **should** do to help prevent leaks, actions or activities you, as an owner or operator, are encouraged to take in order to reduce the potential of leaks.

General Requirement

- These are general requirements needed to be in compliance with regulations.

Specific Ongoing Requirement

- Ongoing testing and record keeping requirements.

Requirement Located in A Different Section

- Refers you to a different page for ongoing testing

A quick guide is located in Appendix K, to help you while you go through this manual.

Chapter 4: Spill Protection

- Spill protection devices are used at fill pipes to catch drips and small spills that may occur when the delivery hose is disconnected from the fill pipe. Many spill protection devices are called “spill buckets” or “catchment basins”.

- Spill protection is typically not designed to contain product for long periods of time.

- Some spill protection devices are equipped with a drain valve or manual pump that allows you to drain accumulated product into your tank. Be aware that when you drain the contents of a spill bucket into your tank, water and debris may also enter the tank. If spill protection is not equipped with a drain valve or pump, then any product or water in your spill bucket must be removed manually and disposed of properly.

✓ Consider using spill protection for USTs that never receive deliveries of more than 25 gallons of product at one time, like waste oil tanks. Overfill protection is part of good UST system management.

Take the following steps to figure out what type of spill protection is being used at your facility.

1. Lift each fill port lid (see pictures on page 7) and look to see if you have spill protection around your fill pipe.

2. Look through your old records to check if you had spill protection installed.

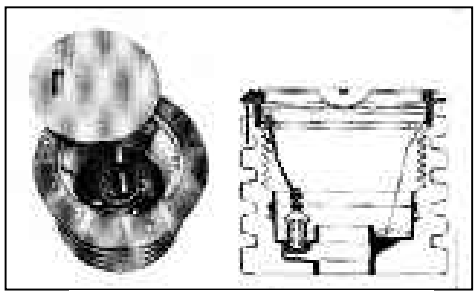
3. Ask the contractor who installed your UST.

Requirements For Spill Protection

You must have spill protection for every UST that is filled with more than 25 gallons of product at one time.

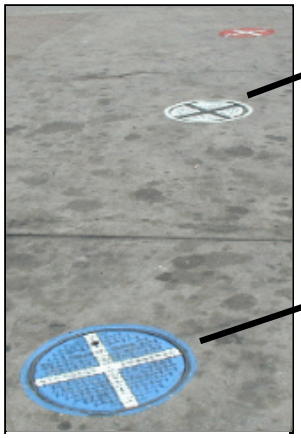
Spill protection must prevent the release of product to the environment when the transfer hose is detached from the fill pipe. The spill protection cannot meet this requirement if it is not able to contain liquid or if it is full of liquid or solid debris when the tank is being filled.

- Periodically check to see if your spill protection will hold liquid.
- Periodically inspect your spill protection for signs of wear, cracks, or holes.
- Make sure your spill protection is empty of liquid and debris before and after each delivery.



Sample Spill
Bucket/Cross-Section

Sample Spill Protection



Sample Fill Area

Chapter 5: Overfill Protection

- Overfill protection is equipment installed on the UST to help prevent your tanks from being overfilled during product delivery.
- Overfill protection is designed to stop product flow, reduce product flow, or alert the delivery person during delivery **before** the tank becomes full and begins releasing product into the environment.

There are three common types of overfill protection:

- overfill alarms
- ball float valves
- automatic shutoff devices

✓ Consider using overfill protection for USTs that never receive deliveries of more than 25 gallons of product at one time like waste oil tanks. Overfill protection is part of good UST system management.

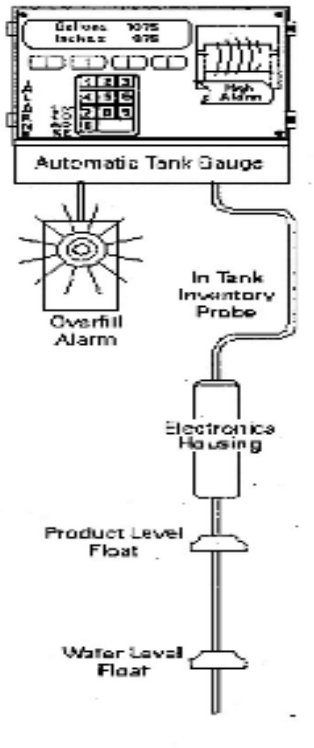
General Requirements For Overfill Protection

You must have overfill protection (for example, an overfill alarm) for every UST that is filled with more than 25 gallons of product at one time.

Take the following steps to figure out what type of overfill Is being used at your facility.

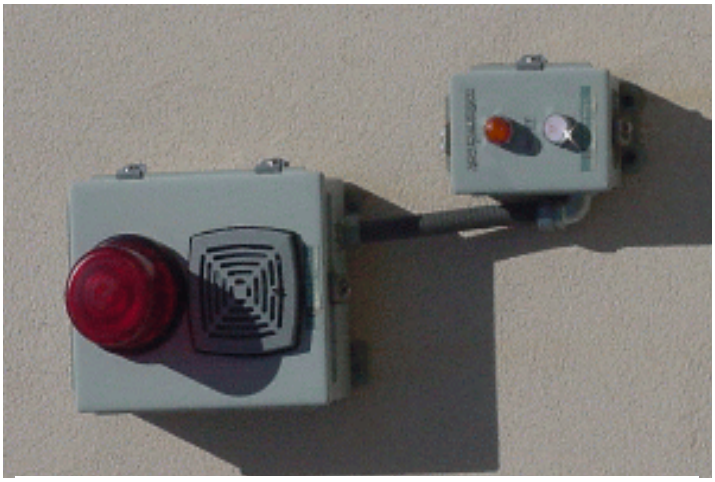
1. Read the descriptions below to determine what type of overfill is at your facility.
2. Look through your old records to see if they match any of the names in the descriptions.
3. Ask the contractor who installed your underground storage tank.
4. Find out what was reported on the last inspection if nothing has been changed.

➢ **Overfill Alarms** - An overfill alarm has a sensor in the tank. The sensor is typically connected to a monitoring device such as an automatic tank gauge (or ATG). An overfill alarm provides a warning that must be seen or heard (or both) by the person delivering the product when the tank is close to being full. The warning activates when the UST is approaching tank capacity and warns the delivery person to stop delivery. When the alarm activates, the delivery person should immediately stop the flow of product to the tank.



Sample Schematic For An Overfill Alarm

- ✓ A qualified UST contractor should periodically check your overfill alarm to make sure it is functioning properly.
- ✓ You should inform your delivery person you have an overfill alarm.
- ✓ You could place a durable sign near each fill pipe. The sign should be **in clear view of the delivery person.** It should say there is an overfill alarm for this tank, what occurs when the alarm activates, and indicate the necessary actions to take. See the sample sign in Appendix D as a reference.



Sample Overfill Alarm

Requirements For Overfill Alarms

- The overfill alarm must activate when the product in the tank reaches 90 percent of the tank capacity or is within one minute of being overfilled.
- The overfill alarm must be located so it can be seen and/or heard from where the UST is filled. This ensures that the person responsible for monitoring the delivery will know when the tank is almost full.

➢ **Ball Float Valves** - A ball float valve (also called a flow vent valve) is located inside the tank where the vent line exits the tank. The ball float valve restricts vapor flow from the UST as the tank gets close to full. As the tank fills, the ball in the valve rises, restricting the flow of vapors out of the UST during delivery. The flow rate of the delivery will decrease noticeably and should alert the person responsible for monitoring the delivery to stop the delivery.
You might find it difficult to determine whether or not you have this device because of where it is located. You might be able to find an extractor port for the ball float valve (see picture below). Otherwise, you will need to look through your paperwork to determine whether your tank has this device or ask the contractor who installed your tanks.

Sample Ball

Close-up of Extractor Port

Sample Ball Float Valve

Sample Extractor Port

- ✓ A qualified UST contractor should periodically check ball float valves to make sure they are functioning properly.
- ✓ You should inform your delivery person you have a ball float valve.
- ✓ You could place a durable sign near each fill pipe saying there is a ball float valve for this tank, what occurs when the device activates, and indicate the necessary actions to take. See the sample sign in Appendix D as a reference.
- ✓ You should not use a ball float valve for overfill protection if any of the following conditions apply because you could create overfills or dangerous situations (such as pressure building up in the tank) resulting in gasoline spraying onto the delivery person or into the environment.

  <u>Do not use ball float valves if</u>:
  - Your UST receives pressurized deliveries,
  - Your UST has suction piping, or
  - The UST has coaxial stage I vapor recovery.
  - Deliveries are made not using tight fit connections

Requirements Ball Float Valves

Ball float valves must begin restricting vapor flow out of the tank when product in the tank reaches 90 percent of tank capacity or at least 30 minutes before the tank will be overfilled. For ball float valves to work properly:

- The air hole in the ball float valve must be open,
- The ball cage must be intact,
- The ball must move freely in the cage,
- The ball must seal tightly on the pipe, and
- The top of the tank must be air tight during delivery so vapors cannot escape from the tank. Everything in the tank (such as other tank access ports, fittings, and drain mechanisms on spill buckets) must be tight and able to hold the pressure created when the ball float valve engages.

➢ **Automatic Shutoff Devices** - An automatic shutoff device is located at the fill pipe of your tank. Look down your fill pipe to see part of this device. You will see what appears to be a line cutting through your fill pipe (or a half moon shape in your fill pipe).

The automatic shutoff device slows down and stops the flow of product during delivery when the product has reached a certain level in the tank.

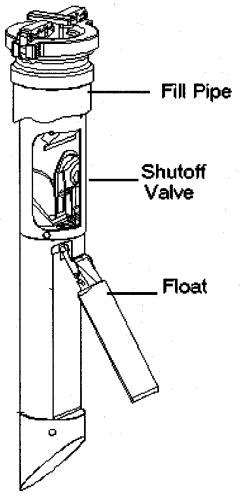
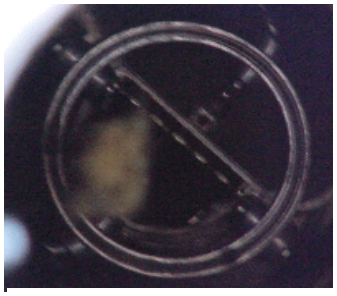


Diagram of an Automatic Shutoff Device



Looking Down A Fill Pipe At An Automatic Shutoff Device

Looking Through The End Of Automatic Shutoff Device

✓ A qualified UST contractor should periodically check your automatic shutoff device to make sure it is functioning properly.

✓ You should inform your delivery person you have an automatic shutoff device.

✓ You could place a durable sign near each fill pipe. The sign should be **in clear view of the delivery person.** It should say there is an automatic shutoff device for this tank, what occurs when the device activates, and indicate the necessary actions to take. See the sample sign in Appendix D as a reference.

✓ You should not use an automatic shutoff device for overfill protection if your tank receives pressurized deliveries because it might create dangerous situations (such as pressure building up in the tank) and result in gasoline spraying onto the delivery person or into the environment.

Requirements For Automatic Shut Off Devices

Automatic shutoff devices must activate when the product in the tank reaches 95 percent of the tank capacity or before the fittings at the top of the tank are exposed to product.

- There must not be anything in the fill pipe that would keep the shutoff mechanism from working properly.
- The automatic shutoff device must be placed so the float arm is not blocked and can move through its full range of motion.

Chapter 6: Corrosion Protection

This Chapter is broken down into 3 sections:

A. Corrosion Protection for Tanks
B. Corrosion Protection for Piping
C. Cathodic Protection

Use this information to determine what tank and piping types you have at your facility.

Note: When you see this symbol after your tank or piping type you will need to go to the instructed page for additional requirements. If you do not meet these requirements, your tank or piping is **not in compliance.**

Section 6A: Corrosion Protection For Tanks

- All of your regulated tanks that are underground and routinely contain product must be protected from corrosion.
- All underground tanks installed after December 22, 1988, need to meet all appropriate construction standards and must be installed according to a standard code of practice and manufacturer's instructions.
- All tanks must be made of or lined with materials that are compatible with the substance stored in the UST.

✓ Keep all paperwork related to your corrosion protected tanks (examples include paperwork related to: installation, cathodic protection, integrity assessment, repair, and internal lining).

Take the following steps to figure out what is at your facility:

1. Read the following descriptions to determine which tank types you have.
2. Look through your old records to see if you have tank installation information. Check for the names of the tank types.
3. Ask the contractor who installed your tank.
4. Find out what was reported on the last inspection if nothing has been changed.

Tank Type Descriptions

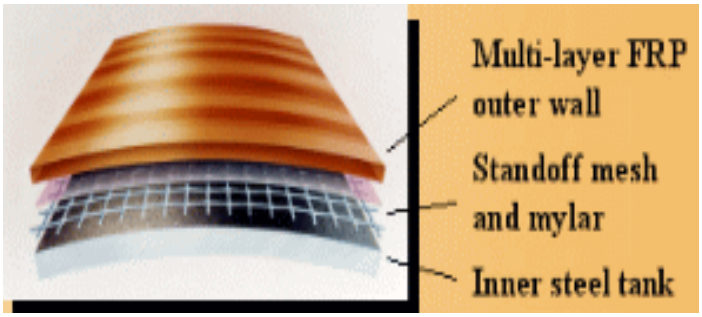
There are three types of tanks that meet corrosion protection requirements without additional equipment, operation, or maintenance:

- **Fiberglass Reinforced Plastic (FRP) Tank** - This tank is made of fiberglass reinforced plastic. Examples of current and past FRP tank makers include Owens Corning, Xerxes, Cardinal, Fluid Containment, and Containment Solutions.

Sample FRP Tank

✓ Have your fiberglass reinforced plastic tanks periodically checked for deflection (deflection is a measure of the roundness of your tank). Since these tanks are made from materials considered to be sensitive to flexing, over deflection may result in cracking and a leak. Allowable deflections vary with tank diameters and may be measured by following the manufacturer's installation checklist.

- **Jacketed Steel Tank** - This is a steel tank that is encapsulated (or jacketed) in a non-corrodible, nonmetallic material such as fiberglass or polyethylene. This tank is secondarily contained. There is a space between the steel wall and the jacket material. This space may be monitored for a breach of either the inner wall or outer jacket. Examples of jacketed tank brands include: Permatank®, Glasteel II®, Titan®, Total Containment®, and Elutron®.



Sample Piece Of A Jacketed Tank

✓ Have your jacketed steel tanks periodically tested by a qualified contractor to make sure the space between the steel tank and secondary jacket is tight. This space is known as the interstitial space or secondary containment area. If your primary tank wall would leak and the secondary containment jacket was not tight, a release could get into the environment and result in cleanup that could be costly and time-consuming.

➢ **Clad Steel Tank** - This tank is a steel tank that has a thick layer of non-corrodible material such as fiberglass or urethane that is mechanically bonded (clad) to the outside of the steel tank. This cladding helps protect the outside of the steel wall from corroding. Examples of clad tank brands include: ACT-100®, ACT-100-U®, Glasteel®, and Plasteel.

Sample Clad Tank

✓ Some clad steel tanks may also have cathodic protection. If you have clad steel tanks that have cathodic protection, then consider having your cathodic protection system tested periodically to make sure it is operating properly.

The following are types of tanks that have additional equipment, operation, or maintenance requirements in order to be in compliance with state and federal regulations:

➢ **Metal Tank With No Additional Corrosion Protection** - This is a tank made of metal such as steel or copper. It does not have cathodic protection, internal lining, or any non-corrodible material that encapsulates or bonds to the outside of the tank.

It is highly unlikely that buried metal tanks with no additional corrosion protection could be used in Tennessee to meet the tank corrosion protection requirements, however, if your tanks meet the criteria below, this option may be used.

Requirements For Metal Tanks With No Additional Corrosion Protection

If you have a regulated underground metal tank without additional corrosion protection, you must either:

Have the record of a corrosion expert's determination that your UST site is not corrosive enough to cause the tank to have a release due to corrosion during the operating life of the tank;

or

Have evidence to indicate that the Division made a determination that the tank construction and corrosion protection were designed to prevent the release or threatened release of any stored product.

➢ **Coated And Cathodically Protected Steel Tank** - This is a steel tank that has both an external coating and cathodic protection on the outside wall of the tank. The coating is typically applied to the tank at the factory. An example of a coated and cathodically protected tank brand is the sti-P_3® tank. This type of tank is usually installed with galvanic (sacrificial) anodes for cathodic protection. However, these tanks may have an impressed current cathodic protection system if the galvanic (sacrificial) anodes no longer protect the tank from corrosion. **If you are not sure whether you have a cathodic protection system, see the *Cathodic Protection* section on page 24 .**

An example of a commonly used coated and cathodically protected steel tank is the sti-P3® tank. This tank has a dielectric coating on the outside and has galvanic (sacrificial) anodes attached to the outside of the tank. You may have had impressed current added to your sti-P3® tank at some time in the past – this tank is still considered to be coated and cathodically projected.

Sample Coated And Cathodically Protected Tank

Requirements For Coated And Cathodically Protected Steel Tanks

The coating must be made of a suitable dielectric material (a material that isolates the tank from the surrounding soil and does not conduct electricity). Coal tar epoxy, urethane, and isophthalic polyester resins are examples of generic types of coatings used on coated and cathodically protected steel tanks;

AND

You must comply with specific testing and record keeping requirements for cathodic protection. **See Section 6C: Cathodic Protection page 24.**

➢ **Cathodically Protected Steel Tank** - This is a steel tank that has a cathodic protection system on the outside of the tank but does not have an external coating. The cathodic protection is most likely by an impressed current system. **If you are not sure whether you have a cathodic protection system, see Section 6C: Cathodic Protection page 24.**

Typically, this type of tank was originally installed as a bare steel tank before December 22, 1988, and had cathodic protection installed at some later date. Tanks installed after December 22, 1988, are required to be both coated and cathodically protected. Bare steel tanks that were not upgraded prior to December 22, 1999, may no longer be upgraded.

Upgrade Requirements for Cathodically Protected Steel Tanks

Only steel tanks that were installed on or before December 22, 1988, may use cathodic protection without a dielectric coating to comply with the corrosion protection requirements.

AND

The tank has been installed for less than 10 years and is monitored monthly for releases with one of the methods described in Chapter 7 beginning on page 31,

OR

An integrity assessment of the tank was conducted before adding cathodic protection. Examples of methods of integrity assessment of a steel tank include:

- An internal inspection of the tank – a trained professional enters a tank to determine if it is structurally sound and free of corrosion holes.
- A video camera inspection of the tank combined with checking soil characteristics around the tank. The tank is emptied and a trained professional places a video camera into the fill ports of a tank to determine if the tank has any holes.
- A detailed site evaluation is performed at your facility – a trained professional evaluates the site characteristics and places the information into a model that statistically determines the time it would take a steel tank to corrode through at that specific location. This information is compared to the age of the tank to statistically determine whether the tank is structurally sound and free of corrosion holes.

OR

The tank was assessed for corrosion holes by a method that was approved by the Division. This method was known as the Tennessee Alternative Method and consisted of conducting tightness testing and monthly monitoring. The first tightness test was conducted within 120 days prior to installation of cathodic protection. If the system was tight, cathodic protection was added, and a second tightness test was conducted between three and six months following the first operation of the cathodic protection system. Once cathodic protection was added, the tank must have been monitored monthly for releases with one of the methods described in Chapter 7 beginning on page 31.

Continuing Requirements for Cathodically Protected Steel Tanks

You must comply with specific testing and record keeping requirements for cathodic protection. These requirements can be found in **See Section 6C: Cathodic Protection page 24.**

➢ **Internally-Lined Steel Tank** - This is a steel tank with an internal lining attached to the inside wall of the tank. Typically, this type of tank was originally installed as a bare steel tank before December 22, 1988, and had an internal lining installed at some later date.

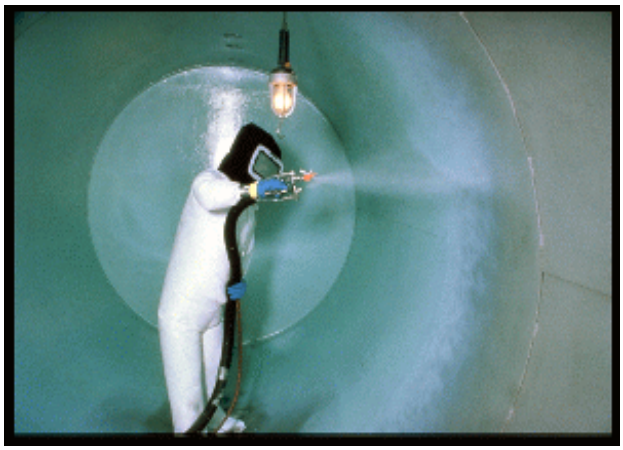


Photo of A Tank Interior Being Lined

✓ Keep records of your lining installation and lining inspections. These records may be useful in determining whether your tank is in compliance with the corrosion protection requirements.

✓ Even though a tank that has internal lining is not required to have external corrosion protection, you should consider adding cathodic protection as part of good UST system management. Note that if you add cathodic protection on your internally-lined tank, you must meet the inspection and testing requirements in beginning on page 26.

Installation Requirements For Internally Lined Steel Tanks

Only steel tanks that were installed on or before December 22, 1988, may use internal lining alone to comply with the corrosion protection requirements.

AND

If any repairs are performed when your tank is internally-lined, you must keep all records of those repairs for the life of the tank.

AND

A tank may be upgraded by internal lining if the following procedures and practices have been followed:

- The storage tank lining material must be compatible with the product to be stored,
- The tank shell shall be structurally sound prior to lining,
- Lining manufacturers directions are followed during installation of lining, and
- After the tank is lined and before the tank is returned to service the tank shall be tank tightness tested according to the instructions on page 35.

Continuing Requirements For Internally Lined Steel Tanks

Within 10 years of lining, lined tanks must be internally inspected and found to be structurally sound with the lining still performing in accordance with original design specifications. After the **initial 10 year inspection, these inspections must be conducted at least every 5 years.**

➢ **Internally-Lined And Cathodically Protected Steel Tank** - This is a steel tank that has both an internal lining and cathodic protection. Typically, this type of tank was originally installed as a bare steel tank before December 22, 1988, and had cathodic protection and internal lining installed at some later date. The cathodic protection may be either impressed current or galvanic (sacrificial) anodes. **If you are not sure whether you have a cathodic protection system, see the *Cathodic Protection* section beginning on page 24.**

Requirements for Internally Lined and Cathodically Protected Steel Tanks

Only steel tanks that were installed on or before December 22, 1988, may use the combination of an internal lining and cathodic protection without a dielectric coating to comply with the corrosion protection requirements,

AND

You must meet all requirements listed on page 16, for cathodically protected steel tanks,

AND

You **must** meet all the Installation requirements for internally lined steel tanks listed on page 17.

You do not need inspections of the lined tank if both of the following apply to your lined and cathodically protected tank:

- The integrity of the steel tank was ensured when cathodic protection was installed,

AND

- The method of integrity assessment determined the steel tank shell was structurally sound and free of corrosion holes.

Section 6B: Corrosion Protection For Piping

- All regulated piping that is in contact with the ground and routinely contains product must be protected from corrosion – **this piping is often underground or buried**.

  Note: fill pipes fitted with a drop tube and vent lines do not need corrosion protection because these components do not routinely contain product.

- All piping that is in contact with the ground and routinely contains product that was installed after December 22, 1988, needs to meet all appropriate construction standards and be installed according to a standard code of practice and the manufacturer's instructions.

- All underground piping must be made of or lined with materials that are compatible with the substance that is stored in the UST.

✓ Keep all paperwork related to your corrosion protected piping (examples include paperwork related to: installation, cathodic protection, and repair).

Take the following steps to figure out what type of piping is at your facility:

1. Read the descriptions below to determine which types of piping you have.

2. Look in your dispenser sumps and turbine sumps (these are areas under your dispenser and above your tank where piping and other equipment are located) to see if you can identify the piping. Some piping may have metal flexible connectors in these areas. Look for the piping beyond the metal flexible connectors.

3. Look through your old records to see if they match any of the names in the descriptions.

4. Ask the contractor who installed your piping.

Piping Type Descriptions

Types of piping that meet corrosion protection requirements without additional equipment, operation, or maintenance:

- **Fiberglass Reinforced Plastic (FRP) Piping** - This piping is nonmetallic and is made of fiberglass reinforced plastic. It is a rigid piping (not flexible). Examples of FRP piping makers include Ameron and Smith Fiberglass Products, Inc. This piping type may also have metal connectors associated with it.

Sample FRP Piping

- **Flexible Plastic Piping** - This type of piping is made of plastic that is flexible. Examples of nonmetallic flexible piping brand names include: Poly-Tech, Dualoy 3000, EnviroFlex, GeoFlex, Perma-Flexx, Omniflex, and Co-Flex™Titan®, Total Containment®, and Elutron®. This piping type may also have metal connectors associated with it.

Sample Flexible Piping

Sample Flexible Piping

Sample Flexible Piping

Sample Flexible Piping In A Sump

Close-up Of Flexible Piping In a Sump

Fiberglass reinforced plastic (FRP) piping and **flexible plastic piping** are made of non-corrodible materials and both meet the corrosion protection requirements without additional equipment or operation and maintenance. However, these types of piping may have metal joints and connectors that are in contact with the ground and routinely contain product. **These metal components must be protected from corrosion.**

Requirements for metal joints and connectors that are in contact with the ground

Any metal piping components associated with these types of piping that are in contact with the ground and routinely contain product, such as turbine pump heads, metal flexible connectors, and metal swing joints **must** be protected from corrosion by one of the following:

- Isolating the metal component from direct contact with the ground (for example: by putting a protective covering or boot on a flexible connector or by moving the soil so it is not in contact with the metal component);

OR

- Cathodically protecting metal components in contact with the ground. If you cathodically protect the metal component, you must meet the cathodic protection requirements beginning on page 24.

➢ **Metal Piping With No Additional Corrosion Protection** - This is metal piping that does not have any additional corrosion protection.

It is highly unlikely that buried metal piping with no additional corrosion protection could be used in Tennessee to meet the corrosion protection requirements, however, if your metal piping meets the criteria below, this option may be used.

Requirements For metal piping with no additional corrosion protection

If you have metal piping without additional corrosion protection that is in contact with the ground and routinely contains product, you must either:

- Have the record of a corrosion expert's determination that your UST site is not corrosive enough to cause the piping to have a release due to corrosion during the operating life of the piping;

OR

- Have evidence to indicate that the Division made a determination that the piping construction and corrosion protection was designed to prevent the release or threatened release of any stored product.

The following are types of piping that have additional equipment, operation, or maintenance requirements in order to be in compliance with state and federal regulations:

- **Coated And Cathodically Protected Steel Piping** - This is steel piping that has both an external coating and cathodic protection. **If you are not sure whether you have a cathodic protection system, see the cathodic protection section beginning on page 24.**

This type of piping has a coating on the outside of the piping and cathodic protection on the outside of the piping. Cathodic protection may be either impressed current or galvanic (sacrificial) anodes. **See the cathodic protection section beginning on page 24.**

Requirements for coated and cathodically protected steel piping

The coating is on the outside of the piping and must be made of a suitable dielectric material (a material that isolates the piping from the surrounding soil and does not conduct electricity);

AND

Make sure that metal piping components such as pump heads, flexible connectors and swing joints are either isolated from the soil or are cathodically protected;

AND

You must comply with specific testing and record keeping requirements for cathodic protection. Descriptions of cathodic protection, requirements and best management practices are in the cathodic protection section beginning on page 26.

➢ **Cathodically Protected Metal Piping** - This is metal piping without an external coating that has a cathodic protection system. Typically, this type of piping was originally installed as a bare metal before December 22, 1988, and had cathodic protection installed at some later date. Piping installed after December 22, 1988, must be both coated and cathodically protected. **If you are not sure whether you have a cathodic protection system, see the cathodic protection section beginning on page 24.**

This type of piping is metal with cathodic protection on the outside of the piping. There is no coating (or no known coating) on this piping. Cathodic protection may be either impressed current or galvanic (sacrificial) anodes. See the cathodic protection section beginning on page 24.

Requirements for cathodically protected metal piping

Only metal piping that was installed on or before December 22, 1988, may use cathodic protection without a dielectric coating to comply with the corrosion protection requirements;

AND

Make sure that metal piping components such as pump heads, flexible connectors and swing joints are either isolated from the soil or are cathodically protected;

AND

You must comply with specific testing and record keeping requirements for cathodic protection. Descriptions of cathodic protection, requirements and best management practices, for cathodic protection are in the cathodic protection section beginning on page 24.

Section 6C: Cathodic Protection

Cathodic protection is one option for meeting the corrosion protection requirements for metal tank and piping components that are in contact with the ground and routinely contain product. Components of your UST that may have cathodic protection include: metal tanks, piping, and piping components such as turbine pump heads, flexible connectors, and swing joints.

There are two types of cathodic protection:

- impressed current,

AND

- galvanic (or sacrificial) anodes.

✓ Keep all paperwork related to your cathodic protection system.

✓ Have cathodic protection tests conducted more frequently than required. The more often you have these tests conducted, the more likely you are to detect cathodic protection problems before releases occur.

Take the following steps to figure out what types of cathodic protection you use at your facility:

1. Read the descriptions on the next page to determine the types of cathodic protection you use.

2. Look through your old records to see if they match any of the names in the descriptions.

3. Ask the contractor who installed your cathodic protection system.

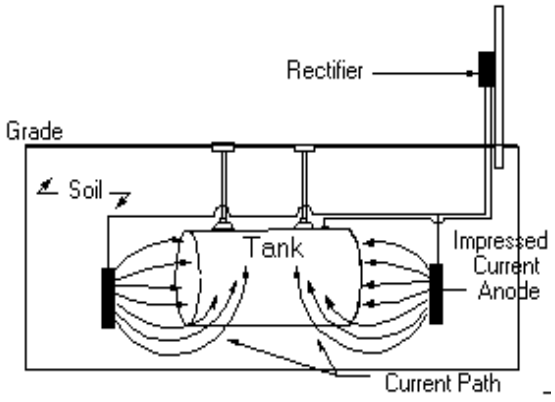
4. Find out what was reported on the last inspection if nothing has been changed.

Cathodic Protection Descriptions

Impressed Current Systems

An impressed current system uses a rectifier (a device that converts alternating current to direct current) to provide direct current through anodes to the metal tank, piping, or other underground components to achieve corrosion protection.

How to tell if you have an impressed current system:
You should have a rectifier located somewhere at your facility.
Impressed current cathodic protection systems are typically installed in the field.



Impressed Current System Diagram

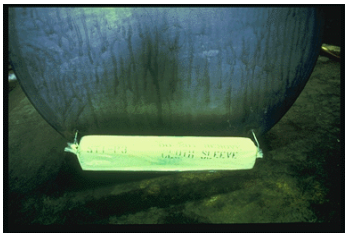
Sample Rectifier

Galvanic (Sacrificial) Anode Systems

A galvanic (sacrificial) anode system uses anodes that are buried and attached to metal UST components for corrosion protection. The anode is more electrically active and will sacrifice itself (corrode) to protect the metal component from corrosion. A sample picture of an anode attached to a tank is shown on the right.

How to tell if you have a galvanic (sacrificial) anode system:
It is more difficult to tell if you have a galvanic anode system because you typically cannot see the anodes and there is no rectifier. The anodes are attached to the underground component they are protecting and are buried. These anodes are usually installed on tanks at the factory (such as on the sti-P3® tank) and can be installed on piping and other underground metal components in the field.

In order to determine whether you have a galvanic system, look at any installation paperwork you might have or contact the contractor who installed the cathodic protection system.



Sample Galvanic
(Sacrificial) Anode

General Requirements For Galvanic Anode and Impressed Current Cathodic Protection

Your cathodic protection system must operate continuously to protect the metal tank and piping components in direct contact with the ground. If your cathodic protection system is disconnected or turned off, your underground UST components are not protected from corrosion. **Never** turn off your rectifier and **never** disconnect a galvanic anode, **unless** contractors need to turn off or disconnect your cathodic protection for short periods during testing or for repairs;

AND

All cathodic protection systems installed in the field must be designed by a corrosion expert. Field installed means the cathodic protection system was not installed when the tank or piping was in the factory. An example of a tank that has a factory installed cathodic protection system is the sti-P3® tank;

AND

All cathodic protection systems used to upgrade tanks must have been installed following the upgrade requirements listed in the cathodic protection section beginning on page 16;

AND

You **must** have your cathodic protection system tested periodically to make sure it is working properly. The test must be conducted by a qualified cathodic protection tester within six months of installation and then **at least every three years.** In addition, if you have any repairs conducted to your cathodically-protected UST, you must have a cathodic protection test conducted within six months of that repair.

A **corrosion expert** must meet specific qualifications. That person must be either:

- Certified by NACE International as a Corrosion Specialist or Cathodic Protection Specialist;

or

- A Registered Professional Engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks.

A **cathodic protection tester** is a person who can demonstrate an understanding of the principles of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems.

Specific Requirements For Galvanic Anode and Impressed Current Cathodic Protection

Both galvanic anode and impressed current cathodic protection systems must be tested periodically to ensure they are working properly.

A test must be conducted within six months of installation and then at least every three years. Keep records of the last two cathodic protection tests.

A sample cathodic protection test record is in Appendix E.

Note: if your cathodic protection system does not pass the test, have your cathodic protection system evaluated and repaired by a corrosion expert. Keep all records of the corrosion expert's evaluation and repairs to your cathodic protection system.

If you have an impressed current cathodic protection system:

You must inspect the rectifier at least every 60 days to make sure it is on and operating properly. Keep records of the last three inspections.

See the following page for a list of things to do during a rectifier inspection. A sample impressed current inspection record keeping form is provided in Appendix F. If your rectifier is not operating properly, contact a corrosion expert to evaluate and repair your cathodic protection system.

Things To Do During Rectifier Inspections

1. Make sure the rectifier is turned on.	Rectifiers always need to be on to protect your tank and piping from corrosion. **Never turn off your rectifier.** • Your rectifier may have a light to indicate that it is turned on • Your rectifier may have an on/off switch
Your rectifier should be directly wired to a dedicated circuit and not plugged into a wall outlet or wired to a light switch.	
2. Record the values from any meters on the rectifier. If you have a meter and voltmeter readings, compare them to operating ranges established by the corrosion expert when the system was first activated.	Some rectifiers may have one or more of the following meters: • Direct current ammeter • Direct current voltmeter • Hour meter
The person who installed your impressed current system should have provided you with paperwork to indicate what the normal operating voltage and amperage values are for your cathodic protection system. If you do not have values for the normal operating voltage and amperage, contact the person who installed the system and obtain that information.	
3. If your rectifier does not appear to be operating properly (such as the rectifier or rectifier light is not on, or meter readings are not within established values), contact a qualified person to find and correct the problem. Remember, only a corrosion expert can make changes to the design of your cathodic protection system. **Warning:** You should not attempt to fix any problems with your rectifier. The rectifier poses an electrical shock hazard.	
Remember to keep all records of repairs and have a cathodic protection test conducted within six months of any repair. Make sure the cathodic protection system passes the test.	

Chapter 7: Release Detection

This Chapter is divided into two sections:

A. Release Detection for Tanks
B. Release Detection for Piping

Use this information to determine what types of release detection you are using at your facility.

Section 7A: Release Detection For Tanks

General Requirements and Best Management Practices For All Tank Release Detection Methods

You are not required to have release detection on emergency generator tanks. All other regulated tanks must have release detection.

- ✓ Make sure your vendor or installer provides you with the information and training necessary to make sure your release detection equipment works effectively to detect leaks.
- ✓ Keep all of your installation and repair records and paperwork for the life of the tank.
- ✓ Periodically have a qualified UST contractor, such as the vendor who installed your release detection system, service your leak detection equipment according to the manufacturer's service instructions. Components can wear out and must be checked periodically. Many vendors recommend or require this maintenance activity at least once annually.
- ✓ Make sure employees who operate, monitor, or maintain the release detection system are trained and know whom to report problems. Develop and maintain regular training programs for all employees.
- ✓ Consider performing release detection on your emergency generator tank as part of good tank management. Remember, you are responsible for responding to, investigating, and reporting any suspected or confirmed releases that occur from your USTs.

Requirements For Release Detection Methods

You must keep records of release detection testing for at least the most recent 12 months.

AND

Your method of release detection must meet specific performance requirements. You must keep documentation from the manufacturer, vendor, or installer for at least five years which shows your release detection equipment can meet performance requirements.

- One way to obtain copies of this documentation is to access the National Work Group for Leak Detection Evaluations list. This list may be found at: http://www.nwglde.org

Your release detection must be installed, calibrated, operated, and maintained according to the manufacturer's instructions.

- Keep all schedules of required calibration and maintenance provided by the equipment manufacturer for at least five years.
- Keep all records of calibration, maintenance, and repair for at least one year after the activity occurred.

AND

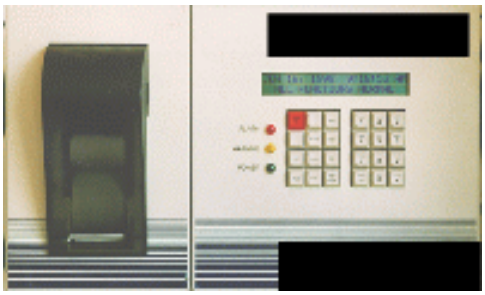
If you ever suspect or confirm a release, you must take appropriate action and, if necessary, report the release. See page 47 for information on what to do. **Never ignore release detection alarms or failed leak detection tests. Treat them as potential leaks.**

Take the following steps to figure out what methods of release detection are being used at your facility.

1. Read the descriptions that follow to determine which tank release detection method you use.
2. Look through your old records to see if they match any of the names in the descriptions.
3. Ask the contractor who installed your release detection system.

➢ **Automatic Tank Gauging (ATG) Systems** - An ATG system is a sensor probe permanently installed in a tank and a console which provides information such as product level and temperature. This console (sometimes called an ATG) will be mounted somewhere at your facility. ATG system monitors automatically calculate the changes in product volume that can indicate a leaking tank and can be set to activate an alarm when there is a suspected problem with your tank.

ATG Monitor



ATG Monitor

✓ Test your tanks more frequently than required in order to catch leaks sooner. Testing more frequently will also help you ensure a valid test result each month.

✓ Frequently test your ATG system according to the manufacturer's instructions to make sure it is working properly.

✓ Read your owner's manual and run the appropriate tests to see if your ATG system is set up and working properly. Most ATG systems have a test or self-diagnosis mode that may run these checks.

✓ Periodically have a qualified UST contractor, such as the vendor who installed your ATG, service all the ATG system components according to the manufacturer's service instructions.

- Tank sensors and other components can wear out and must be checked periodically.
- Many vendors recommend or require this maintenance activity at least once annually.

Requirements For Automatic Tank Gauging

Use your ATG system to test for leaks at least once every 30 days for each tank and keep a record of the result for at least one year. Your ATG system must be able to detect a 0.2 gallon per hour leak rate with at least a 95 percent probability of detection and no more than 5 percent probability of false alarm.

- Remember to test each tank at least once per month and maintain result for at least one year.
- Make sure you are properly testing the portion of the tank that routinely contains product.
- Make sure the amount of product in your tank is sufficient to run the ATG leak test. The tank must contain a minimum amount of product to perform a valid leak detection test. (This information should be on the performance certification for your leak detection equipment.)

➢ **Secondary Containment With Interstitial Monitoring** - Secondary containment is an additional barrier between the portion of an UST that contains product and the outside environment. Examples of secondary containment include the outer tank wall of a double-walled system, an excavation liner, and a bladder inside a tank. The area between the inner and outer barriers is called the interstitial space and can be monitored manually or automatically. You may have interstitial monitoring ports on the pavement at your facility.

✓ If you have an electronic system, you should frequently test your interstitial monitoring system according to the manufacturer's instructions to make sure it is working properly.

✓ If you have an electronic interstitial monitoring system, periodically have a qualified UST contractor, such as the vendor who installed it, service all the system components according to the manufacturer's service instructions.

Requirements For Secondary Containment with Interstitial Monitoring

Use your Interstitial monitoring system to test for leaks **at least once every 30 days** for each tank and keep a record of the result for at least one year.

Interstitial monitoring systems must be designed, constructed and installed to detect a leak from any part of the tank that routinely contains product.

For double-walled tanks, the test method must be able to detect a release through the inner wall.

For a secondary containment barrier in the excavation zone (for example an external liner), the following must be met:

- The barrier must be thick and impermeable (at least 10^{-6} cm/sec for the product stored);
- The barrier must be compatible with the product stored;
- The barrier must be installed so that it does not interfere with the proper operation of any cathodic protection system;
- groundwater, soil moisture, or rainfall will not make the testing or sampling method inoperative so that a release could go undetected for more than 30 days;
- A site assessment is conducted to make sure that the secondary barrier is always above the groundwater and not in a 25 year flood plain (unless the barrier and monitoring designs are for use under these conditions); and
- Monitoring wells are clearly marked and secured.

For tanks with internally fitted liners, the automated device must be able to detect a release between the inner wall of the tank and the liner. The liner also must be compatible with the product stored.

➢ **Groundwater Monitoring** - Groundwater monitoring uses monitoring wells placed around your tank field to look for the presence of liquid product floating on the groundwater at the UST site. You should be able to see monitoring well covers at your facility. There are two ways you can perform groundwater monitoring:

- **Manual** - use a bailing device (see picture below) to check each well for product at least once every 30 days.
- **Electronic** - use an electronic monitor at your facility connected to electronic sensors in the monitoring well that checks for the presence of product at least once every 30 days.

Sample Monitoring Well Cover

Bailing A Groundwater Monitoring Well

✓ If you have an electronic system, you should frequently test your monitoring system according to the manufacturer's instructions to make sure it is working properly.

✓ If you have an electronic monitoring system, periodically have a qualified UST contractor, such as the vendor who installed it, service all the system components according to the manufacturer's service instructions.

Requirements For Groundwater Monitoring

Test **each monitoring well** for leaks at least once every 30 days and keep a record of the result for at least one year.

You must keep all of your groundwater monitoring ports clearly marked and secured.
According to American Petroleum Institute Recommended Practice 1637, monitoring well covers should be marked with a solid white circle containing a solid black triangle.

A site assessment must have been conducted at your facility to determine the following:

- The appropriate number and placement of monitoring wells so that any release from the UST will be detected;
- Groundwater at your facility is never more than 20 feet below the surface;
- The hydraulic conductivity of the soil between your UST and the monitoring wells is not less than 0.1 cm/s (i.e., the soil should consist of gravels, coarse to medium sands, coarse silts, or other permeable materials);
- The product stored in your tank does not mix or blend with water;
- The slotted part of the well casing allows product to collect in the well, but does not allow surrounding soil to enter under both low groundwater and high groundwater conditions;
- Monitoring wells are sealed from the ground surface to the top of the filter pack;
- Monitoring wells are in the excavation zone or are as close to it as feasible; and
- The method used for detection can determine the presence of at least one-eighth of an inch of free product on top of the water in the monitoring well.

A release is suspected when an automatic or continuous monitoring device signals an alarm or any liquid product is observed on top of groundwater in a monitoring well.

➢ **Vapor Monitoring** - Vapor monitoring uses monitoring wells to look for the presence of vapors in the soil at the UST site. Vapor monitoring will not work well with product that does not easily vaporize (such as diesel fuel). You should be able to see monitoring well covers at your facility. There are two ways you can perform vapor monitoring:

- **Manual** - use a hand-held device such as a photo-ionization detector (PID) or flame-ionization detector (FID) to check for vapors at each monitoring well at least once every 30 days.
- **Electronic** - use an electronic monitor at your facility connected to electronic sensors in each monitoring well that check for the presence of vapors at least once every 30 days.

Sample PID

✓ If you have an electronic system, you should frequently test your vapor monitoring system according to the manufacturer's instructions to make sure it is working properly.

✓ If you have an electronic vapor monitoring system, periodically have a qualified UST contractor, such as the vendor who installed it, service all the system components according to the manufacturer's service instructions.

✓ Check your monitoring wells more frequently in order to catch leaks sooner.

Requirements For Vapor Monitoring

Use your vapor monitoring system to test for leaks at least once every 30 days and keep a record of the result for at least one year. Remember to check each monitoring well.

You must keep all vapor monitoring ports clearly marked and secured.

According to American Petroleum Institute Recommended Practice 1637, monitoring well covers should be marked with a solid white circle containing a solid black triangle.

A site assessment must have been conducted at your facility to determine the following:

- The appropriate number and placement of monitoring wells so that any release from the UST will be detected,
- The materials used as backfill must be porous enough to readily allow vapor movement from a release (e.g., gravel, sand, crushed rock),
- The product stored in the tank or tracer compound can vaporize enough to be detected by the monitor,
- The measurement of vapors by the monitoring device is not made inoperative by groundwater, rainfall, soil moisture, or other interferences that would allow a release to go undetected for more than 30 days,
- Background contamination in the excavation zone must not cause any interference, and
- Vapor monitors are designed and operated to detect any significant increase in the concentration (above the background levels) of product stored in the tank, a component or components of that product, or a tracer compound placed in the tank system.

A release is suspected if an automatic continuous monitoring device signals an alarm, any liquid petroleum product is observed in wells, any significant increase in petroleum concentration compared to background levels is discovered, or a tracer component from tank is detected by a monitoring device.

➢ **Inventory Control And Tank Tightness Testing** - This method involves measuring the contents of the tank, recording the amount of product pumped each day, and reconciling that data with measurements and records of product delivery. Typically, a measuring stick is used to take the measurements. This combined method also includes tightness testing every five years. **This method may only be used for up to ten years after installing a new tank or upgrading an existing tank with corrosion protection.**

✓ For more consistent stick measurements, have the same person stick the tank at the same time each day.

Requirements For Inventory Control And Tank Tightness Testing

You may use this combination method for up to ten years after installing a new UST or for up to ten years after your existing tank met the corrosion protection requirements.

For inventory control you must do the following:

- Take inventory and dispenser readings and record the numbers at least once each day that product is added to or removed from your tank.
- Reconcile deliveries with delivery receipts by taking inventory readings before and after each delivery.
- Reconcile all of your data at least once every 30 days and record the results.
- You must make sure your product dispensers are calibrated according to local standards or to an accuracy of six cubic inches for every five gallons of product withdrawn.
- Keep inventory records for at least one year.
- You must measure the water in your tank to the nearest one-eighth inch at least once a month. You can use a water-paste that changes color when it comes into contact with water.
- See Appendix J for sample monthly inventory record.

Your equipment or electronic monitoring device must be capable of measuring to the nearest one-eighth inch and be able to measure the level of product over the full range of the tank's height.

- Check your measuring stick periodically to make sure you can read the markings and numbers, that the bottom of the stick is not worn, and that the stick is not broken, bowed, or warped.

All Deliveries must be made through a drop tube that extends to within one foot of the tank bottom.

You must have a tightness test conducted at least once every five years.

- The test may be conducted by a trained tester or by using a permanently installed electronic system.
- Make sure the method of tank tightness testing is certified for the types of tanks you have and for the product you store in those tanks.
- The tightness test must be capable of detecting a 0.1 gallon per hour leak rate from any portion of the tank that routinely contains product.
- Keep the results of your most recent tightness test.

A leak is suspected when ***2 consecutive months*** show daily overages or shortages that are greater than 1.0 percent of the total monthly flow through + 130 gallons (This is considered a failing result).

➢ **Manual Tank Gauging** - Manual tank gauging alone may be used only for tanks of 1,000 gallons or less capacity. It involves taking your tank out of service for the testing period each week, during which the contents of the tank are measured at the beginning and end of the test period. Typically, a measuring stick is used to take the measurements. The measurements are then compared to weekly and monthly standards to determine if the tank is tight.

Requirements For Manual Tank Gauging

Only tanks of 1,000 gallons or less meeting the size and test requirements in the table below may use manual tank gauging.

Tank Size	Minimum Period Of Test	Weekly Standard (One Test)	Monthly Standard (Four Test Average)
up to 550 gallons (any tank diameter)	36 hours	10 gallons	5 gallons
551-1,000 gallons (when tank diameter is 64")	44 hours	9 gallons	4 gallons
551-1,000 gallons (when tank diameter is 48")	58 hours	12 gallons	6 gallons

You must perform weekly testing as follows:

- Take your tank out of service for the period of the test to ensure no product is added or removed.
- Record two inventory readings at the beginning and end of the test period.
- Reconcile the numbers weekly and keep records. For the tank to pass, the difference between the beginning and ending measurements cannot exceed the weekly standard value listed in the third column of the table above.

  Instructions and a record keeping form are provided in Appendix H.

You must reconcile your records every 4 weeks to obtain monthly numbers. For the tank to pass, the difference between the average of the four weekly beginning and ending measurements cannot exceed the monthly standard value listed in the fourth column of the table above. Instructions and a record keeping form are provided in Appendix I.

Your equipment (e.g., your measuring stick) must be capable of measuring to the nearest one-eighth inch and be able to measure the level of product over the full range of the tank's height.

Check your measuring stick periodically to make sure you can read the markings and numbers, that the bottom of the stick is not worn, and that the stick is not broken, bowed, or warped.

A leak is suspected if the difference between beginning and ending measurements exceeds weekly or monthly standards listed in table above.

➢ **Manual Tank Gauging And Tank Tightness Testing** - This method is for tanks of 2,000 gallons or less capacity. Manual tank gauging involves taking your tank out of service for the testing period each week, during which the contents of the tank are measured at the beginning and end of the test period. Typically, a measuring stick is used to take measurements. The measurements are then compared to weekly and monthly standards to determine if the tank is tight. This combined method also includes tightness testing every five years. **This method may only be used for up to ten years after installing a new tank or upgrading an existing tank with corrosion protection.**

Requirements For Manual Tank Gauging And Tank Tightness Testing

Manual tank gauging combined with tank tightness testing is a temporary release detection method that may be used for up to 10 years after installing a new UST or for up to 10 years after your existing tank met the corrosion protection requirements.

Only tanks of 2,000 gallons or less meeting the size and test requirements in the table below may use manual tank gauging combined with tank tightness testing. **See page 36 if your tank is 1,000 gallons or less and you can use manual tank gauging only.**

Tank Size	Minimum Period Of Test	Weekly Standard (One Test)	Monthly Standard (Four Test Average)
551 - 1,000 gallons	36 hours	13 gallons	7 gallons
1,001 - 2,000 gallons	36 hours	26 gallons	13 gallons

See Page 36 for Manual Tank Gauging Requirements

You must have a tightness test conducted at least once every five years.

- The test may be conducted by a trained tester or by using a permanently installed electronic system.
- Make sure the method of tank tightness testing is certified for the types of t a n k s you have and for the product you store in those tanks.
- The tightness test must be capable of detecting a 0.1 gallon per hour leak rate from any portion of the tank that routinely contains product.
- Keep the results of your most recent tightness test.

➢ **Statistical Inventory Reconciliation (SIR)** - SIR is a method of release detection where computer software is used to conduct a statistical analysis of inventory, delivery, and dispensing data collected every 30 days. A measuring stick or an ATG is commonly used to gather the inventory data. SIR must be able to detect a 0.2 gallon per hour leak rate with at least a 95 percent probability of detection and no more than 5 percent probability of false alarm. Depending on the vendor, you may either have to send your data to the vendor and receive a report or enter the data into a computer program that provides you with the results. The result of the analysis may be *pass*, *inconclusive*, or *fail*.

✓ Many vendors require you to measure product to the nearest one-eighth inch (for example by using a stick or electronic monitoring device) and that the equipment be capable of measuring the level of product over the full range of the tank's height.

- If you have a measuring stick, check it periodically to make sure you can read the markings and numbers, that the bottom of the stick is not worn, and that the stick is not broken, bowed, or warped.
- For more consistent measurements, take measurements at the same time each day.

✓ If you use an automatic tank gauge to gather inventory data, periodically have a qualified UST contractor, such as the vendor who installed it, service all the system components according to the manufacturer's service instructions.

✓ Make sure your product dispensers are calibrated according to local standards.

✓ Measure the water in your tank to the nearest one-eighth inch at least once per month. You can use a water finding paste on your measurement stick that changes color when it comes into contact with water.

Requirements For Statistical Inventory Control

You must supply inventory data to your SIR vendor (or enter your inventory data into a computer software program and generate your leak detection results) at least once every 30 days. If you submit your data, a vendor will provide you with your leak detection results after the statistical analysis is completed. Keep your SIR results for at least one year.

- Make sure the vendor provides your results quickly so you know whether or not your tank is leaking every 30 days.
- Check with your SIR vendor or computer software to determine what specific inventory data is necessary.
- Follow all procedures for Inventory Control listed on page 35.

If you receive an **inconclusive** result, you must correct the problem (the problem might be poor measurement techniques or something more serious such as a release) and document the results of the investigation.

- An **inconclusive** result means you have not received a passing leak detection result for that month.
- A release is suspected when you have ***1 failing result, or 2 consecutive inconclusive results,*** unless monitoring device is defective and repaired immediately. (You must keep all repair records).

Section 7B: Release Detection For Piping

When looking at release detection requirements for piping, we must look at how product is delivered through the piping. There are several types of product delivery systems for piping that could be used with underground storage tanks. A product delivery system is piping that delivers product from one tank to another tank or from a tank to a dispenser. Product delivery systems may be either pressurized or operate by suction. In addition, piping could either be above ground or underground. The release detection requirements apply to piping delivery systems that are underground only. The release detection requirements are different depending on whether the piping delivery system is pressurized or suction.

If you have piping associated with an emergency generator tank, then that piping is not required to have release detection.

Take the following steps to figure out what methods of release detection are being used at your facility.

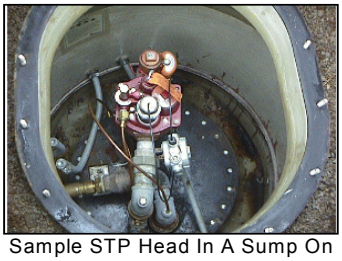
1. Read the descriptions on the next pages to determine which types of piping you have.

2. Look through your old records to see if they match any of the names in the descriptions.

3. Ask the contractor who installed your piping system.

4. Find out what was reported on the last inspection if nothing has been changed.

➢ **Pressurized product delivery** pushes product from the tank to the dispenser through piping. Pressurized piping commonly uses a submersible turbine pump (STP) located inside the tank. You should be able to tell if you have a pressurized piping system by looking for a STP head in a sump above the tank. These sumps are usually covered with a lid and may also have a sump cover under the lid. In rare cases, pressurized piping delivery may be by gravity feed. Gravity feed has no pump and relies on the downward slope of the piping to transport product.


Sample STP Head In A Sump On Top Of A Tank


Sample Lid And Sump Cover


Sample STP Head In A Sump On Top Of A Tank

Requirements For Pressurized Piping Release Detection

Pressurized piping must have an automatic line leak detector (LLD) installed. You must meet specific requirements for your LLDs. **See page 42 for information and check-lists for LLDs.**

Along with a LLD, each pressurized piping run must have **one** of the following:

- **monthly vapor or groundwater monitoring -** If you are using groundwater or vapor monitoring for your tank, you may use these methods for your piping also.
- **monthly SIR** - monthly SIR results apply to tanks and piping systems.
- **monthly interstitial monitoring** - to use this method, your piping must be secondarily contained and you must be monitoring the interstitial space at least once every 30 days for releases.
- **Annual line tightness test** - you must have a line tightness test conducted at least every 12 months for pressurized piping. **See page 43 for information for line tightness testing.**

If you use monthly groundwater monitoring (page 33), vapor monitoring (page 34), or SIR (page 38), the requirements are the same for both tanks and piping. Monitoring wells need to be placed appropriately to detect a release from all parts of the piping.

If you use interstitial monitoring (page 32), the requirements are the same for both tanks and piping. In addition, if you use sump sensors, you must ensure the following for interstitial monitoring for piping:

- Sensors are typically located in the turbine or dispenser sump areas for interstitial monitoring. These sumps must be tight and free of leaks for piping interstitial monitoring to operate correctly.
    - Piping must slope to the sump containing the monitoring sensor.
    - Make sure the rubber boot is pulled back from the outer wall of the piping so product will drain into the sump if a problem occurs.
    - Make sure the sump does not have any water in it.
    - Make sure the sensor is located at the bottom of the sump so it activates quickly when a release occurs.

➢ **Suction product delivery** pulls product from the tank to the dispenser through the piping by using a suction pump located at the dispenser. You should be able to tell if you have suction piping by looking for a suction pump (you may see pulleys and belts) inside the dispenser. There will not be a STP pump head in a sump above the tank.

Release detection is NOT required for suction piping that meets the following conditions:

- The piping is sloped so product will drain back to the tank when suction is lost;

and

- There is only one check valve located as close as practical to the suction pump beneath the dispenser.

Piping that meets these two criteria is sometimes called "safe suction" or European suction.

Piping that does not meet these conditions is sometimes called U.S. suction or American suction.

Example Of A Suction Pump Inside A Dispenser

Requirements For Suction Piping Release Detection

If you have suction piping, you must meet one of the following:

- **Monthly vapor or groundwater monitoring -** If you are using groundwater or vapor monitoring for your tank, you may use these methods for your piping also.
- **Monthly SIR** - monthly SIR results apply to tanks and piping systems.
- **Monthly interstitial monitoring** - to use this method, your piping must be secondarily contained and you must be monitoring the interstitial space at least once every 30 days for releases.
- **Line tightness test every three years** - you must have a line tightness test conducted at least every three years for suction piping. **See page 43 for information on line tightness testing.**
- **No release detection** if you meet the criteria for safe suction described in the box above.

If you use monthly groundwater monitoring (page 33), vapor monitoring (page 34), or SIR (page 38), the requirements are the same for both tanks and piping. Monitoring wells need to be placed appropriately to detect a release from all parts of the piping.

If you use interstitial monitoring (page 41), the requirements are the same for both tanks and piping. **In addition**, if you use sump sensors, you must ensure the following for interstitial monitoring for piping:

Interstitial monitoring sensors are typically located in a sump above the tank or the dispenser sump areas. These sumps must be tight and free of leaks for piping interstitial monitoring to operate correctly.

- Piping must slope to the sump containing the monitoring sensor.
- Make sure the rubber boot is pulled back from the outer wall of the piping so product will drain into the sump if a problem occurs.
- Make sure the sump does not have any water in it.
- Make sure the sensor is located at the bottom of the sump so it activates quickly when a release occurs.

Automatic Line Leak Detectors

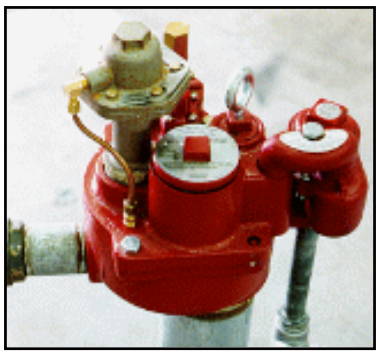
Automatic line leak detectors (LLD) are devices designed to detect a catastrophic release from pressurized piping. Typically, they are located on the submersible turbine pump (STP) head in the sump above your tank.

There are two types of automatic LLDs:

- **Mechanical** LLDs are mechanically operated pressure valves that test for piping leaks each time the pump is turned on.
- **Electronic** LLDs have an electronic detection element that connects to an electronic control panel and monitors for piping releases.

Some interstitial monitoring devices may also serve as LLDs and many electronic LLDs are able to conduct line tightness tests.

✓ Make sure your LLDs are designed to operate with the type of product your UST stores. For example, some LLDs are designed to work with gasoline, while others are intended to work with diesel.



Specific Requirements For Automatic Line Leak Detectors

Pressurized piping must have a LLD installed that can detect a release of three gallons per hour at a line pressure of 10 pounds per square inch within one hour.

When a leak is detected, automatic LLDs must either:

- Shut off product flow;
- Restrict product flow; or
- Trigger an alarm that you can see or hear.

You must have a test conducted that demonstrates proper functioning on each LLD at least every 12 months. The test must be performed according to the manufacturer's instructions.

You must keep a record of the LLD tests for at least one year.

You must have all records of any calibration, maintenance, or repair of your LLDs that were performed in the last 12 months.

If you have LLDs that are less than five years old, you must have all records of performance claims, as well as calibration and maintenance schedules.

Line Tightness Testing

A periodic **line tightness test** may be used to meet release detection requirements for your piping. Line tightness testing may be performed by either a qualified tester or by using a permanently installed electronic system. Line tightness testing must be able to detect a 0.1 gallon per hour leak rate at 1.5 times the operating pressure of the piping, or an equivalent pressure if an electronic line leak detector is used.

✓ If you use a permanently installed electronic line leak detector, periodically have a trained contractor such as the vendor who installed the system service that system according to the manufacturer's instructions

Specific Requirements For Line Tightness Testing

You must keep records of line tightness testing results until the next tightness test is conducted.

- For pressurized piping, testing is required every 12 months.
- For suction piping, testing is required every three years, unless the piping has a "safe suction" system described on page 41.
- If electronic line leak detectors are used for line tightness testing, you must have documentation for one of the following:

  An annual 0.1 gph leak test has been conducted in the last 12 months

  or

  A monthly 0.2 gph leak test has been conducted for the last 12 months.

If you use a permanently installed electronic system, you must keep records of any calibration, maintenance, or repair of your equipment that were conducted in the last 12 months.

.

If you have an electronic system which is less than five years old, you must have all records of performance claims, as well as calibration and maintenance schedules.

Chapter 8: Notification, Repairs, Temporarily Out of Service, and Suspected and Confirmed Releases

This Chapter is broken down into 4 sections:

8A. Notification
8B. Repairs
8C. Temporarily Out of Service
8D. Suspected and Confirmed Releases

Note: When you see this symbol after your tank or piping type you will need to go to the instructed page for additional requirements. If you do not meet these requirements your tank or piping is **not in compliance.**

Section 8A: Notification

Requirements For Notifying the Division

You must notify the Division anytime changes are made to any of your USTs.

The following changes must be reported to the Division within 30 days of the change:

- Change in ownership;
- Change in contact person;
- Change in Address of Owner or Operator;
- Change in tank or tank equipment; or
- Change in tank contents; and change in piping or piping equipment.

Within 30 days of bringing an UST into use, you must submit a notification form to the Division. This form can be obtained from the following:

You can print a notification from our Website:

http://www.state.tn.us/environment/ust/

You can request a notification form or pick one up at any Environmental Field Office or at:

Tennessee Department of Environment and Conservation
Division of Underground Storage Tanks
4th Floor L & C Tower
401 Church Street
Nashville, Tennessee 37243

Section 8B: Repairs

Requirements For Repairs

Repairs to UST systems must be made to effectively prevent releases for the life of the UST system.

If you have a fiberglass-reinforced plastic tank, repairs may be made by the manufacturer's authorized representative or according to manufacturer's specifications.

Metal piping sections and fittings that have released product must be replaced. Fiberglass pipe and fittings may be repaired according to manufacturer's specifications.

Repaired tanks and piping must meet one of the following:

- Be tightness tested within 30 days of the repair.
- The repaired portion is monitored for monthly releases using one of the following:
  - Automatic Tank Gauging
  - Vapor Monitoring
  - Groundwater Monitoring
  - Interstitial Monitoring
  - Statistical Inventory Reconciliation
  - Another method approved by the Division
- Be internally inspected (Tanks Only).

Cathodically protected UST systems that are repaired must have a cathodic protection test performed within six months of the repair to make sure the cathodic protection system is working properly.

You must keep records of all repairs for the remaining operating life of the UST system.

Section 8C: Temporarily Out of Service

Requirements For Temporarily Out of Service Tanks

If your UST is not empty, it must continue to meet the leak detection requirements for both tank and piping.

Note: An empty tank means that no more than one inch of residue (including product, sludge, water, etc.) or 0.3 percent by weight of the total tank capacity, remain in the UST. Empty tanks do not require leak detection.

All corrosion protection systems must remain operational and must continue to be monitored. Vent lines should remain open.

If an UST remains temporarily closed for more than three months, you must leave vent lines **open,** but **close** all other lines, pumps, man ways, and ancillary equipment by capping and securing them.

You must respond to any releases from your temporarily closed UST, just as you would from an UST that you are currently using.

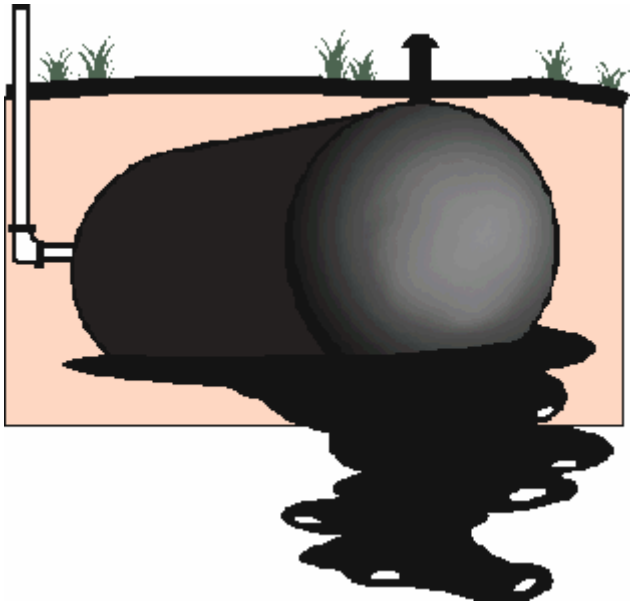
Section 8D: Suspected And Confirmed Releases

Personnel at your facility should be fully prepared to respond to releases before they occur. In addition, employees need to know what to do when release detection methods indicate a suspected or confirmed release.

Requirements For Suspected and Confirmed Releases

- You must respond to, investigate, and report suspected or confirmed releases when they occur.

- You must report a suspected or confirmed release to the **Division within 72 hours** of its discovery. This should include but not be limited to monitoring results that show possible leaks, unusual operating conditions such as sudden loss of product, unexplained presence of water in the tank, and presence of petroleum on or near your facility.



Steps that will assist you in responding to suspected or confirmed releases

Step 1. Stop The Release

- Take immediate action to prevent the release of more product.
- Turn off the power to the dispenser and bag nozzle with appropriate equipment.
- Make sure you know where your emergency shutoff switch is located.
- If necessary, empty the tank. Be careful to avoid further contaminating the site. You may need the assistance of your supplier or distributor.

Step 2. Contain The Release

Contain, absorb, and clean up any surface release. You should keep enough absorbent material at your facility to contain a spill or overfill of petroleum products until emergency response personnel can respond to the incident.

The suggested supplies include, but are not limited to, the following:

- Containment devices, such as containment booms, dikes, and pillows.
- Absorbent material, such as kitty litter, chopped corn cobs, sand, and sawdust. Be sure you properly dispose of used absorbent materials.
- Mats or other material capable of keeping spill or overfill out of nearby storm drains.
- Spark-free flash light.
- Spark-free shovel.
- Buckets.
- Reels of caution tape, traffic cones, and warning signs.
- Personal protective gear.

Step 3. Identify Any Hazards

Identify any fire, explosion, or vapor hazards and take action to neutralize them.

Step 4. Call For Help

Contact your local fire or emergency response authority. Make sure you have these crucial telephone numbers prominently posted where you and your employees can easily see them.

Step 5. Report To Authorities

If you observe any of the following, contact the Division to report a suspected or confirmed release as soon as possible (within 24 hours):

- Any spill or overfill of petroleum that exceeds 25 gallons or causes a sheen on nearby surface water. Spills and overfills under 25 gallons that are contained and immediately cleaned up do not have to be reported. If they cannot be quickly cleaned up, they must be reported to your regulatory authority.
- Any released product at the UST site or in the surrounding area — such as the presence of liquid petroleum, soil contamination, surface water or groundwater contamination, or petroleum vapors in sewer, basement, or utility lines.
- Any unusual operating conditions you observe — such as erratic behavior of the dispenser, a sudden loss of product, or an unexplained presence of water in the tank. However, you are not required to report if the system equipment is found to be defective, but not leaking, and is immediately repaired or replaced.

✓ Keep a list of emergency contacts and make sure everyone at your UST facility is familiar with the list of contacts. **Appendix B contains a blank list for names and phone numbers of important contacts.**

Appendix A: Quick Guides

Pages	Guide – 1 Spill, Overfill, Notification, Repairs, Temporary Closures, and Suspected and Confirmed Releases	
6	**Spill Protection** Spill protection must be installed on all tanks that receive more than 25 gallons in a single delivery.	
8	**Overfill Protection** Overfill protection must be installed on all tanks that receive more than 25 gallons in a single delivery.	
44	**Notification** You must report any changes to your UST system, facility information, or Owner/Operator information to the Division within 30 days of change.	
45	**Repairs** All repair records must be kept for the operating life of the UST.	
	Repaired tanks and piping must be tightness tested 30 days following completion of repair.	
	Cathodic protection systems are to be tested 6 months of repair.	
46	**Temporarily Out of Service Tanks**	
	Operation of cathodic protection must continue	
	Release detection must continue unless tank has been emptied of residue (empty = no more than 1” or 0.3% by weight of the total tank capacity).	
	If your tank is temporarily out of service for more than 3 months you must do the following:	
	File an amended notification form to the Division showing the tank system as Temporarily Out of Service.	
	Leave vent lines open and functioning.	
	Cap and secure all other lines, pumps, man-ways, and ancillary equipment.	
47	**Suspected or Confirmed Releases**	
	You must report a suspected or confirmed release to the Division within 72 hours of discovery.	
	Follow suspected release procedures as directed by the Division.	
	Follow corrective action procedures as directed by the Division.	

Pages	**Guide – 2** **Corrosion Protection**	Minimum Frequency
12	**<u>Corrosion Protection for Tank</u>** All of your tanks must have corrosion protection. Your tanks must have one of the following 5:	
13,14	**Tank meets requirement without additional equipment, operation, or maintenance.**	
13,14	**Tank has no corrosion protection but is determined by an expert or the Division to be protected from corrosion**.	
16,18, 24-28	**Tank has cathodic protection.** There are two types of cathodic protection listed below.	
25-28	<u>Impressed Current</u>	
	Tested by qualified cathodic protection tester six within months after installation and then at least every three years.	Within 6 months of installation/repairs and every 3 years
	Rectifier must be inspected at least every 60 days.	Every 60 days
25-28	<u>Galvanic (or sacrificial) anodes</u>	
	Tested by qualified cathodic protection tester six months of installation and then at least every three years.	Within 6 months of installation/repairs and every 3 years
17	**Tank has internal lining.**	
	Within 10 years of lining, lined tanks must be internally inspected by a qualified contractor. After the initial 10 year inspection, these inspections must be conducted at least every 5 years	Within 10 years of installation every 5 years thereafter
18	**Tank is internally lined and has cathodic protection.**	
	Same as "Tank has cathodic protection" above. Lining inspection does not have to be conducted as long as integrity of tank was insured before cathodic protection was installed.	
19-28	**<u>Corrosion Protection for Piping, Metal Joints and Connectors</u>** All of your piping must have corrosion protection. Your piping must have one of the following 3:	
20	**Piping meets requirement without additional equipment, operation, or maintenance.**	
21	**Piping has no corrosion protection but is determined by an expert or the Division to be protected from corrosion.**	
22-28	**Piping has cathodic protection.** There are two types of cathodic protection listed below.	
25-28	<u>Impressed Current</u>	
	Tested by qualified cathodic protection tester six within months after installation and then at least every three years.	Within 6 months of installation/repairs and every 3 years
	Rectifier must be inspected at least every 60 days.	Every 60 days
25-28	<u>Galvanic (or sacrificial) anodes</u>	
	Tested by qualified cathodic protection tester six months of installation and then at least every three years.	Within 6 months of installation/repairs and every 3 years

Pages	**Guide – 3** **Release Detection**	Minimum Frequency
29	**Release Detection for Tanks** All tanks except emergency generators are required to have release detection. Your tanks must have one of the following 8:	
31	**Automatic Tank Gauging** Must have the last 12 months of records.	Every 30 days
32	**Secondary Containment with Interstitial Monitoring** Must have the last 12 months of records.	Every 30 days
33	**Groundwater Monitoring** Must have the last 12 months of records.	Every 30 days
34	**Vapor Monitoring** Must have the last 12 months of records.	Every 30 days
35	**Inventory Control and Tank Tightness Testing** Must have the last 12 months of records and last tank tightness test.	Every 30 days and (Tightness Test: every 5 years)
36	**Manual Tank Gauging** Must have the last 12 months of records.	Every 4 weeks
37	**Manual Tank Gauging and Tank Tightness Testing** Must have the last 12 months of records and last tank tightness test.	Every 4 weeks and (Tightness Test: every 5 years)
38	**Statistical Inventory Reconciliation** Must have the last 12 months of records.	Every 30 days
39	**Release Detection for Piping** All piping that is in contact with the ground and routinely contains product, except Safe/European Suction, is required to have release detection.	
40-43	**Pressurized Piping**	
42	Is required to have an Automatic Line Leak Detector Leak detector must be tested once every 12 months for proper function.	Every 12 months
	One of the following methods of release detection:	
43	Annual Line Tightness Test	Every 12 Months
43	Monthly Line Tightness Test Performed with an electronic line leak detector (if this method is used 12 months of records must be available).	Every 30 days
40	Vapor monitoring, groundwater monitoring, SIR, or interstitial monitoring **(**If you are using any of these methods the requirements are the same as for tanks)	Every 30 days
41	**Suction Piping**	
	Safe or European Suction (see page 43 for details) There are no requirements.	
	U.S. or American Suction must have one of the following:	
	Line Tightness Test Conducted once every 3 years.	Every 3 years
	Vapor monitoring, groundwater monitoring, SIR, or interstitial monitoring If you are using any of these methods the requirements are the same as for tanks.	Every 30 days

Appendix B: Sample Emergency Numbers List

Important Contact Information

	Contact Name	Phone #
State UST Agency:		
Local UST Agency:		
Fire Department:		
Ambulance:		
Police Department:		
Repair Contractor:		
Other Contacts:		

Release Response Checklist

- ☐ **Stop The Release:** Take immediate action to prevent the release of more product. Turn off the power to the dispenser and wrap a plastic bag around the nozzle. Make sure you know where your emergency shutoff switch is located. Empty the tank, if necessary, without further contaminating the site.
- ☐ **Contain The Spill Or Overfill:** Contain, absorb, and clean up any surface releases. Identify any fire, explosion, or vapor hazards and take action to neutralize these hazards.
- ☐ **Call For Help And Report Suspected Or Confirmed Releases:** Contact your local fire or emergency response authority. Contact your state's underground storage tank regulatory authority within 24 hours.

Appendix C: For More Information

This section identifies UST program contacts and other resources that can help answer your questions and provide you with information about good UST management.

State Regulatory Agency Information

Tennessee Department of Environment And Conservation
Division of Underground Storage Tanks
4th Floor L&C Tower
401 Church Street
Nashville, Tennessee 37243

A map of the Tennessee Underground Storage Tank Field Offices with contacts can be found on the following page.

Internet Resources

State of Tennessee
http://www.state.tn.us/environment/ust

There are copies of the complete rules and regulations for Tennessee's underground storage tanks as well as copies of most forms.
Note: If you do not have internet access you may request a hardcopy of the rules from the address above.
You can submit any questions to the following email address - askust@state.tn.us

U.S. Government Links

- U.S. Environmental Protection Agency's (EPA) Office of Underground Storage Tanks Home Page: http://www.epa.gov/oust. To go directly to the compliance assistance section of the Home page go to: http://www.epa.gov/swerust1/cmplastc/index.htm. To go directly to EPA's listing of publications, go to: http://www.epa.gov/swerust1/pubs/index.htm.
- U.S. EPA Office of Enforcement and Compliance Assurance compliance assistance website: http://www.epa.gov/compliance/assistance/index.html

Professional And Trade Association Links

- American Petroleum Institute (API): http://www.api.org/
- American Society For Testing and Materials (ASTM): http://www.astm.org/index.html
- Fiberglass Tank and Pipe Institute (FTPI): http://www.fiberglasstankandpipe.com
- NACE International - The Corrosion Society: http://www.nace.org/
- National Fire Protection Association (NFPA) : http://www.nfpa.org
- Petroleum Equipment Institute (PEI): http://www.pei.org
- Steel Tank Institute (STI): http://www.steeltank.com/
- Underwriters Laboratories (UL): http://www.ul.com

Free Informative Publications Available From EPA

The publications listed on the next pages are free and available from the U.S. EPA. You can access these publications via EPA's website or you can call, write to, or fax EPA.

- You can download, read, or order documents from http://www.epa.gov/swerust1/pubs/index.htm.
- To order free copies or ask questions, call EPA's **toll-free** RCRA/Superfund Hotline at 800-424-9346 or call EPA's publication distributor's **toll-free** number at 800-490-9198 or fax 513-489-8695. You can also write and ask for **free** publications by addressing your request to EPA's publication distributor: National Service Center for Environmental Publications (NSCEP), Box 42419, Cincinnati, OH 45242.
- Fax-on-Demand allows you to call 202-651-2098 on your fax to access over 220 UST documents.

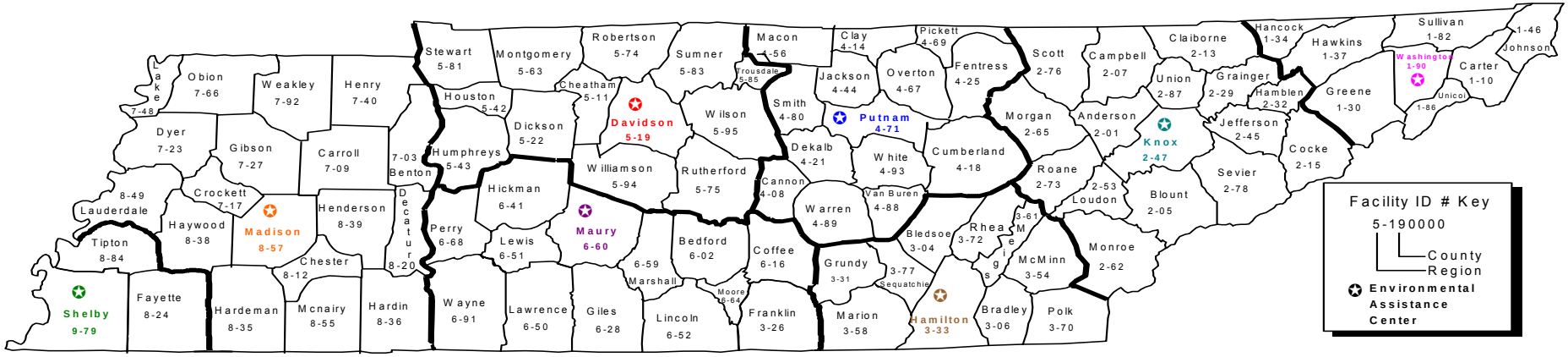
A list of documents that might be of interest are listed following the Field Office map

TENNESSEE DIVISION OF UNDERGROUND STORAGE TANKS

FIELD OFFICES

CENTRAL OFFICE ADDRESS 4th Floor, L & C Tower
401 Church Street
Nashville, TN 37243-1541

(615) 532-0945
(615) 532-9759 (Fax)
Website: http://www.tdec.net/ust



JOHNSON CITY FIELD OFFICE

Region 1

2305 Silverdale Rd.
Johnson City, TN 37601-2162
(423) 854-5400
(423) 854-5401 (Fax)

Alan Hayes (ABH)..... (423-854-5441)
Mitzie Berry (MLB) ..... (854-5444)
Harold Doty (HMD) ..... (854-5445)
Heather Mott (HLM) ..... (854-5486)
Donald Taylor (DNT)..... (854-5391)
Margaret Williamson (MGW).. (854-5443)

KNOXVILLE FIELD OFFICE

Region 2

2700 Middlebrook Pike, Suite 200
Knoxville, TN 37921-5602
(865) 594-6035
(865) 594-5253 (Fax)

Steve Wilson (STW) ..... (865-594-5448)
Wayne Clifford (EWC)..... (594-5453)
Rick Huchison (RH) ..... (594-5456)
Ryan Hyers (DRH)..... (594-5449)
Jane Roach (JER) ..... (594-5447)
Adam Smith (ADS) ..... (594-5454)
Gary Zellmer (GDZ) ..... (594-5455)

CHATTANOOGA FIELD OFFICE

Region 3

540 McCallie Avenue, Suite 550
Chattanooga, TN 37402
(423) 634-5745
(423) 634-6389 (Fax)

Randy Slater (WRS)..... (423-634-5737)
Dan Dorman (DAD)..... (634-5729)
Nicole Lizotte (NRL)..... (634-5760)
Donene Payne (DRP)..... (634-5722)
Bruce Rohrbaugh (MBR)..... (634-5850)
Tim Thompson (JTT)..... (634-5723)

COOKEVILLE FIELD OFFICE

Region 4

1221 South Willow Ave.
Cookeville, TN 38506
(931) 432-4015
(931) 432-6952 (Fax)

Rocky Hannah (EDH) ..... (931-432-7622)
Rita Thompson (RMT) ..... (432-7629)
Ed Fowler (ELF)..... (432-7625)
Dennis Smith (DES) ..... (432-7628)

NASHVILLE FIELD OFFICE

Region 5

711 R. S. Gass Blvd
Nashville, TN 37243
(615) 687-7000
(615) 687-7078 (Fax)

Jim Barnes (JAB)..... (615-687-7018)
Ricky Cathey (RC) ..... (687-7087)
Michael Finks (MAF)..... (687-7093)
Isabelle Ford (IF)..... (687-7094)
Thomas Krinov (TAK) ..... (687-7092)
David Pominski (DHP)..... (687-7098)
John Wright (JW) ..... (687-7089)
VACANT

3/07/2006

COLUMBIA EAC

Region 6

2484 Park Plus Drive
Columbia, TN 38401
(931) 380-3371
(931) 380-3397 (Fax)

Dale Robinson..... (931-840-4145)
Maria Matoska (MM) (840-4147)
Mark Mashburn (MSM)..... (840-4146)

JACKSON FIELD OFFICE

Region 7 & 8

362 Carriage House Drive
Jackson, TN 38305-2222
(731) 512-1300
(731) 661-6283 (Fax)

Ronda Johnson (RJJ) .....(731-512-1342)
George Cassidy (GNC) .....(512-1346)
Dennis Graves (DLG)..... (512-1344)
Robert Strong (RTS) ..... (512-1335)
Andrew Taylor (AMT) ..... (512-1344)

MEMPHIS FIELD OFFICE

REGION 9

Perimeter Park, Suite E-645
2510 Mt. Moriah
Memphis, TN 38115-1520
(901) 368-7939
(901) 368-7979 (Fax)

Cindy Patton (CJP) ..... (901-368-7971)
Karen Prosser (KLP) ..... (368-7917)
David Groce (DAG)..... (368-7913)
Sharon Harrison (SLH) ..... (368-7976)
Chuck Nance (CDN)..... (368-7991)
Jeff Phillips (RJP) ..... (368-7974)

Document	Description
General Information About USTs And Your Requirements	
Operating And Maintaining Underground Storage Tank Systems: Practical Help And Checklists (September, 2005)	Contains brief summaries of the federal UST requirements for operation and maintenance, as well as practical help that goes beyond the requirements. Checklists prompt the user to look closely at what kinds of equipment are in use and how to keep equipment working properly over the lifetime of the UST. The manual provides record keeping forms to help the UST owner and operator keep equipment operating properly.
Musts For USTs: A Summary Of Federal Regulations For Underground Storage Tank Systems (July 1995)	Plain language summary of federal UST requirements for installation, release detection, spill, overfill, and corrosion protection, corrective action, closure, reporting and record keeping.
Underground Storage Tanks: Requirements And Options (June 1997)	Trifold leaflet alerts UST owners and operators who are nonmarketers (who do not sell stored petroleum) of their responsibilities and choices for complying with federal UST regulations.
Leak Detection Information	
Straight Talk On Tanks: Leak Detection Methods For Petroleum Underground Storage Tanks (September 1997)	Explains federal regulatory requirements for leak detection and briefly describes allowable leak detection methods.
Automatic Tank Gauging Systems For Release Detection: Reference Manual For Underground Storage Tank Inspectors (August 2000)	Contains detailed information on automatic tank gauging (ATG) systems, including information on various types of ATGs, information on certified detectable leak rate/threshold, test period duration, product applicability, calibration requirements, restrictions on the use of the device, vendor contact information, printing and interpreting reports, sample reports, and so on.
Getting The Most Out Of Your Automatic Tank Gauging System (March 1998)	Trifold leaflet provides UST owners and operators with a basic checklist they can use to make sure their automatic tank gauging systems work effectively and provide compliance with federal leak detection requirements.
Doing Inventory Control Right: For Underground Storage Tanks (November 1993)	Booklet describes how owners and operators of USTs can use inventory control and periodic tightness testing to temporarily meet federal leak detection requirements. Contains record keeping forms.
Manual Tank Gauging: For Small Underground Storage Tanks (November 1993)	Booklet provides simple, step-by-step directions for conducting manual tank gauging for tanks 2,000 gallons or smaller. Contains record keeping forms.
List Of Leak Detection Evaluations For UST Systems, 9th Edition (November 2001) ***Available through the EPA website**	A summary of specifications, based on third-party certifications, for over 275 systems that detect leaks from USTs and their piping. Each summary provides information on such items as certified detectable leak rate/threshold, test period duration, product applicability, calibration requirements, restrictions on the use of the device, and so on.
Introduction To Statistical Inventory Reconciliation: For Underground Storage Tanks (September 1995)	Booklet describes how Statistical Inventory Reconciliation (SIR) can meet federal leak detection requirements.
Information On Closing Underground Storage Tanks	
Closing Underground Storage Tanks: Brief Facts (July 1996)	Trifold leaflet presents brief facts on properly closing USTs in order to comply with federal closure requirements**.**

Document	Description
Financial Responsibility Information	
Dollars And Sense: Financial Responsibility Requirements For Underground Storage Tanks (July 1995)	Booklet summarizes the financial responsibility required of UST owners and operators.
List Of Known Insurance Providers For Underground Storage Tanks (January 2000)	Booklet provides UST owners and operators with a list of insurance providers who may be able to help them comply with financial responsibility requirements by providing suitable insurance mechanisms.
Financial Responsibility For Underground Storage Tanks: A Reference Manual (January 2000)	This detailed, comprehensive manual provides UST inspectors with the restrictions, limitations, and requirements of each financial responsibility mechanism provided in the federal UST regulations.

***Available through the EPA website**

Delivery Person – Avoid Overfills

An **overfill alarm** is used for overfill protection at this facility.

Do not tamper with this alarm in any attempt to defeat its purpose.

When the tank is 90 percent full or is within one minute of being overfilled, the overfill alarm sounds and/or a light comes on or flashes.

If you hear the alarm or see the light on or flashing,

Stop The Delivery Immediately!

Appendix E: Tennessee Cathodic Protection Testing Form

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF UNDERGROUND STORAGE TANKS

CORROSION PROTECTION MONITORING FORM

(Not required for tanks equipped with PP-4 test station)

Facility Information
(Print or Type)

Facility Name _____

Street Address _____

City _____

State _____ Zip _____

Name/Address of Testing Company

_____

_____

_____

Phone Number (____) _____

Person Conducting Test _____

Date of Test _____

Facility Identification Number ___--___ ___ ___ ___ ___ ___ ____

Number of Tanks _____

Tank Type _____

Piping Material _____

Type of Corrosion Protection (Galvanic or Impressed Current)

For Impressed Current Systems Only

Rectifier Serial Number _____

Voltage _____ Current _____

Conclusion _____

Comments _____

_____

_____

In the space below, sketch the important parts of the facility (tanks, tank manway locations, vents, pump islands, buildings, etc.). Indicate reference cell locations where structure-to-soil potential or continuity measurements have been made using letters of the alphabet. Include tank sizes and type of product stored. Use these letters in the tables on the following pages to indicate reference cell locations.

My signature below is affirmation that I have sufficient education and/or experience to meet the definition of cathodic protection tester in Tennessee Rule 1200-1-15-.01(3)(h) [40 CFR 280.12], I am competent to perform the tests indicated above, that test results on this form are a complete and truthful record of all testing at this location on the date shown, and that I am responsible for all conclusions contained therein.

_____ _____

Name Date

(continued on reverse)

Facility Name _____ Facility I. D. Number ___ --___ ___ ___ ___ ___ ___

CONTINUITY MEASUREMENTS (GALVANIC & IMPRESSED CURRENT SYSTEMS)
(Use separate sheet for each type, if necessary.)

Contact Points (Take readings wherever access is available)	Voltage	Comments (continuous, isolated)
TANK 1		
A. Tank Bottom		
B. Fill Pipe Riser		
C. Pump Riser		
D. Tank Monitor		
E. Product Piping		
F. Vent Line		
G. Test Station Lead Wire		
H. Other:		
Reference Cell Location:		
TANK 2		
A. Tank Bottom		
B. Fill Pipe Riser		
C. Pump Riser		
D. Tank Monitor		
E. Product Piping		
F. Vent Line		
G. Test Station Lead Wire		
H. Other:		
Reference Cell Location:		
TANK 3		
A. Tank Bottom		
B. Fill Pipe Riser		
C. Pump Riser		
D. Tank Monitor		
E. Product Piping		
F. Vent Line		
G. Test Station Lead Wire		
H. Other:		
Reference Cell Location:		

My signature below is affirmation that I have sufficient education and/or experience to meet the definition of cathodic protection tester in Tennessee Rule 1200-1-15-.01(3)(h) [40 CFR 280.12], I am competent to perform the tests indicated above, that test results on this form are a complete and truthful record of all testing at this location on the date shown, and that I am responsible for all conclusions contained therein.

_____ _____
Name Date

Facility Name _____ Facility I. D. Number ___--___ ___ ___ ___ ___ ___ ___

STRUCTURE TO SOIL POTENTIAL MEASUREMENTS (GALVANIC SYSTEM)			
Contact Points (Take readings wherever access is available)	Location of Reference Cell	Voltage	Comments (Pass, Fail, etc.)
TANK 1			
A. Tank Bottom			
B. Fill Pipe Riser			
C. Pump Riser			
D. Tank Monitor			
E. Product Piping			
F. Vent Line			
G. Test Station Lead Wire			
H. Other:			
TANK 2			
A. Tank Bottom			
B. Fill Pipe Riser			
C. Pump Riser			
D. Tank Monitor			
E. Product Piping			
F. Vent Line			
G. Test Station Lead Wire			
H. Other:			
TANK 3			
A. Tank Bottom			
B. Fill Pipe Riser			
C. Pump Riser			
D. Tank Monitor			
E. Product Piping			
F. Vent Line			
G. Test Station Lead Wire			
H. Other:			

My signature below is affirmation that I have sufficient education and/or experience to meet the definition of cathodic protection tester in Tennessee Rule 1200-1-15-.01(3)(h) [40 CFR 280.12], I am competent to perform the tests indicated above, that test results on this form are a complete and truthful record of all testing at this location on the date shown, and that I am responsible for all conclusions contained therein.

_____ Name

_____ Date

(continued on reverse)

Facility Name _____ Facility I. D. Number ___--___ ___ ___ ___ ___ ___ ___

100 MILLIVOLT POLARIZATION DECAY MEASUREMENTS (FOR IMPRESSED CURRENT SYSTEMS)
(Not required if Instant Off Voltage reading exceeds 850 millivolts)

Contact Points (Take readings wherever access is available)	Location of Reference Cell	Voltage (Current On)	Instant Off Voltage	Final Voltage	Voltage Decay	Comments (Pass, Fail, etc.)
TANK 1						
A. Tank Bottom						
B. Fill Pipe Riser						
C. Pump Riser						
D. Tank Monitor						
E. Product Piping						
F. Vent Line						
G. Test Station Lead Wire						
H. Other:						
TANK 2						
A. Tank Bottom						
B. Fill Pipe Riser						
C. Pump Riser						
D. Tank Monitor						
E. Product Piping						
F. Vent Line						
G. Test Station Lead Wire						
H. Other:						
TANK 3						
A. Tank Bottom						
B. Fill Pipe Riser						
C. Pump Riser						
D. Tank Monitor						
E. Product Piping						
F. Vent Line						
G. Test Station Lead Wire						
H. Other:						

My signature below is affirmation that I have sufficient education and/or experience to meet the definition of cathodic protection tester in Tennessee Rule 1200-1-15-.01(3)(h) [40 CFR 280.12], I am competent to perform the tests indicated above, that test results on this form are a complete and truthful record of all testing at this location on the date shown, and that I am responsible for all conclusions contained therein.

_____ _____
Name Date

Appendix F: Tennessee Impressed Current 60 Day Inspection Form

STATE OF TENNESSEE
IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM
60-DAY RECORD OF RECTIFER OPERATION

- This form may be utilized to document that the cathodic protection system rectifier is checked for operation at least once every 60 days.
- Checked for operation is taken to mean that it was confirmed the rectifier was receiving power and is "turned-on".
- If your rectifier is so equipped, you should also record the output voltage, amperage and the number of hours indicated on the meter.
- Any significant variance should be reported to your corrosion professional so that any repairs and/or adjustments necessary can be made.

UST OWNER		UST FACILITY	
NAME:		NAME:	ID #
ADDRESS:		ADDRESS:	
CITY:	STATE:	CITY:	COUNTY:

IMPRESSED CURRENT RECTIFIER DATA

Rectifier Manufacturer:	Rated DC Output: _____ VOLTS _____AMPS
Rectifier Model:	Rectifier Serial Number:

What is the 'as designed' or lastly recommended rectifier output? _____ VOLTS _____AMPS

60-DAY LOG OF RECTIFIER OPERATION

DATE INSPECTED	RECTIFIER TURNED ON?	TAP SETTINGS		DC OUTPUT		HOUR METER	INSPECTOR INITIALS	COMMENTS
		COARSE	FINE	VOLTS	AMPS			

Appendix G: Sample 30 Day Release Detection Monitoring Record

(could be used for monitoring wells, interstitial monitoring, and automatic tank gauging)

Release Detection Method:_____

Facility Name:_____

Date	Your Name	UST (Tank & Piping) (Enter N for no release detected or Y for a suspected or confirmed release)				
		UST #	UST #	UST #	UST #	UST #

If your release detection system reports a suspected or confirmed release, take appropriate actions. See page for what to do for suspected or confirmed releases.

Keep This Piece Of Paper And Any Associated Printouts On File
For At Least One Year From The Date Of The Last Entry

Appendix H: Sample Daily Inventory Worksheet

Facility Name: _____

Your Name: _____

Date: _____

Tank Identification					
Type Of Product					
Tank Size In Gallons					
End Stick Inches					
Amount Pumped					
Totalizer Reading					
Totalizer Reading					
Totalizer Reading					
Totalizer Reading					
Totalizer Reading					
Totalizer Reading					
Totalizer Reading					
Totalizer Reading					
Today's Sum Of Totalizers					
Previous Day's Sum Of Totalizers					
Amount Pumped Today					
Delivery Record					
Inches Of Product Before Delivery					
Gallons Of Product Before Delivery (from tank chart)					
Inches Of Product After Delivery					
Gallons Of Product After Delivery (from tank chart)					
Gallons Delivered (Stick) [Gallons After ! Gallons Before]					
Gross Gallons Delivered (Receipt)					

Appendix I: Sample Manual Tank Gauging Record

MANUAL TANK GAUGING RECORD

Month _____ **Year** _____

Facility Name _____

Address _____

Circle your tank size, test duration, and weekly/monthly standards in the table below: **Person Completing Form** _____

Tank Size	Minimum Duration Of Test	Weekly Standard (1 test)	Monthly Standard (4-test average)
up to 550 gallons	36 hours	10 gallons	5 gallons
551-1,000 gallons (when tank diameter is 64")	44 hours	9 gallons	4 gallons
551-1,000 gallons (when tank diameter is 48")	58 hours	12 gallons	6 gallons
551-1,000 gallons (also requires periodic tank tightness testing)	36 hours	13 gallons	7 gallons
1,001-2,000 gallons (also requires periodic tank tightness testing)	36 hours	26 gallons	13 gallons

Compare your weekly readings and the monthly average of the 4 weekly readings with the standards shown in the table on the left.

If the calculated change exceeds the weekly standard, the UST may be leaking. Also, the monthly average of the 4 weekly test results must be compared to the monthly standard in the same way.

If either the weekly or monthly standards have been exceeded, the UST may be leaking. As soon as possible, call your implementing agency to report the suspected leak and get further instructions.

Start Test (month, day, and time)	First Initial Stick Reading	Second Initial Stick Reading	Average Initial Reading	Initial Gallons (convert inches to gallons) [a]	End Test (month, day, and time)	First End Stick Reading	Second End Stick Reading	Average End Reading	End Gallons (convert inches to gallons) [b]	Change In Tank Volume In Gallons + or (-) [a- b]	Tank Passes Test circle Y or N
Date: AM/PM Time:					Date: AM/PM Time:						Y N
Date: AM/PM Time:					Date: AM/PM Time:						Y N
Date: AM/PM Time:					Date: AM/PM Time:						Y N
Date: AM/PM Time:					Date: AM/PM Time:						Y N
									To see how close you are to the monthly standard, divide the sum of the 4 weekly readings by 4 and enter result here >		Y N

KEEP THIS PIECE OF PAPER ON FILE FOR AT LEAST 1 YEAR

Appendix J: Sample Monthly Inventory Record

Month/Year :_____/_____ Tank Identification And Type Of Product:_____

Facility Name:_____

Date Of Water Check: _____ Level Of Water (Inches):_____

Date	Start Stick Inventory (Gallons)		Gallons Delivered		Gallons Pumped		Book Inventory (Gallons)	End Stick Inventory (Inches)	End Stick Inventory (Gallons)	Daily Over (+) Or Short (!) [End ! Book]	Initials
1		(+)		(-)		(=)					
2		(+)		(-)		(=)					
3		(+)		(-)		(=)					
4		(+)		(-)		(=)					
5		(+)		(-)		(=)					
6		(+)		(-)		(=)					
7		(+)		(-)		(=)					
8		(+)		(-)		(=)					
9		(+)		(-)		(=)					
7		(+)		(-)		(=)					
8		(+)		(-)		(=)					
9		(+)		(-)		(=)					
10		(+)		(-)		(=)					
11		(+)		(-)		(=)					
12		(+)		(-)		(=)					
13		(+)		(-)		(=)					
14		(+)		(-)		(=)					
15		(+)		(-)		(=)					
16		(+)		(-)		(=)					
17		(+)		(-)		(=)					
18		(+)		(-)		(=)					
19		(+)		(-)		(=)					
20		(+)		(-)		(=)					
21		(+)		(-)		(=)					
22		(+)		(-)		(=)					
23		(+)		(-)		(=)					
24		(+)		(-)		(=)					
25		(+)		(-)		(=)					
26		(+)		(-)		(=)					
27		(+)		(-)		(=)					
28		(+)		(-)		(=)					
29		(+)		(-)		(=)					
30		(+)		(-)		(=)					
31		(+)		(-)		(=)					

Total Gallons Pumped > _____ **Total Gallons Over Or Short >** _____

Drop the last two digits from the **Total Gallons Pumped** number and enter on the line below. Compare these numbers

Leak Check: _____ + 130 = _____ gallons

Is the **Total Gallons Over Or Short** larger than the **Leak Check** result? **Yes** **No** (circle one)

If your answer is yes for 2 months in a row, notify the regulatory agency as soon as possible.

Keep This Piece Of Paper On File For At Least One Year

Appendix K: Definitions

This appendix contains both definitions from the federal UST regulations at 40 C.F.R. Part 280 and definitions developed or gathered specifically for this model workbook and are not listed in the regulations. The definitions are separated below into these two categories.

Definitions In The Federal UST Regulations At 40 C.F.R. Part 280

Accidental Release means any sudden or non-sudden release of petroleum from an UST that results in a need for corrective action and/or compensation for bodily injury or property damage neither expected nor intended by the tank owner or operator.

Ancillary Equipment means any devices including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of regulated substances to and from an UST.

Beneath the surface of the ground means beneath the ground surface or otherwise covered with earthen materials.

Cathodic Protection is a technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell. For example, a tank system can be cathodically protected through the application of either galvanic anodes or impressed current.

Cathodic Protection Tester means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

CERCLA means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

Compatible means the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the UST.

Connected Piping means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which regulated substances flow. For the purpose of determining how much piping is connected to any individual UST system, the piping that joins two UST systems should be allocated equally between them.

Corrosion Expert means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. Such a person must be accredited or certified as being qualified by the National Association of Corrosion Engineers or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks.

Dielectric Material means a material that does not conduct direct electrical current. Dielectric coatings are used to electrically isolate UST systems from the surrounding soils. Dielectric bushings are used to electrically isolate portions of the UST system (e.g., tank from piping).
Existing Tank System means a tank system used to contain an accumulation of regulated substances or for which installation has commenced on or before December 22, 1988. Installation is considered to have

commenced if:

(a) the owner or operator has obtained all federal, state, and local approvals or permits necessary to begin physical construction of the site or installation of the tank system; and if,

(b) (1) either a continuous on-site physical construction or installation program has begun;

or,

(2) the owner or operator has entered into contractual obligations – which cannot be cancelled or modified without substantial loss – for physical construction at the site or installation of the tank system to be completed within a reasonable time.

Farm Tank is a tank located on a tract of land devoted to the production of crops or raising animals, including fish, and associated residences and improvements. A farm tank must be located on the farm property. Farm includes fish hatcheries, rangeland and nurseries with growing operations.

Flow-Through Process Tank is a tank that forms an integral part of a production process through which there is a steady, variable, recurring, or intermittent flow of materials during the operation of the process. Flow-through process tanks do not include tanks used for the storage of materials prior to their introduction into the production process or for the storage of finished products or by-products from the production process.

Hazardous Substance UST System means an underground storage tank system that contains a hazardous substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (but not including any substance regulated as a hazardous waste under subtitle C) or any mixture of such substances and petroleum, and which is not a petroleum UST system.

Heating Oil means petroleum that is No. 1, No. 2, No. 4-light, No. 4-heavy, No. 5-light, No. 5-heavy, and No. 6 technical grades of fuel oil; other residual fuel oils (including Navy Special Fuel Oil and Bunker C); and other fuels when used as substitutes for one of these fuel oils. Heating oil is typically used in the operation of heating equipment, boilers, or furnaces.

Hydraulic Lift Tank means a tank holding hydraulic fluid for a closed-loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

Maintenance means the normal operational upkeep to prevent an underground storage tank system from releasing product.

New Tank System means a tank system used to contain an accumulation of regulated substances and for which installation has commenced after December 22, 1988. (See also Existing Tank System.)

Noncommercial Purposes with respect to motor fuel means not for resale.

Occurrence means an accident, including continuous or repeated exposure to conditions, which results in a release from an UST.

On The Premises Where Stored with respect to heating oil means UST systems located on the same property where the stored heating oil is used.

Operator means any person in control of, or having responsibility for, the daily operation of the UST system.

Overfill Release is a release that occurs when a tank is filled beyond its capacity, resulting in a discharge of the regulated substance to the environment.

Owner means:

(a) in the case of an UST system in use on November 8, 1984, or brought into use after that date, any person who owns an UST system used for storage, use, or dispensing of regulated substances; and

(b) in the case of any UST system in use before November 8, 1984, but no longer in use on that date, any person who owned such UST immediately before the discontinuation of its use.

Petroleum UST System means an underground storage tank system that contains petroleum or a mixture of petroleum with *de minimis* quantities of other regulated substances. Such systems include those containing motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Pipe or **Piping** means a hollow cylinder or tubular conduit that is constructed of non-earthen materials.

Pipeline Facilities (Including Gathering Lines) are new and existing pipe rights-of-way and any associated equipment, facilities, or buildings.

Regulated Substance means

(a) any substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (but not including any substance regulated as a hazardous waste under subtitle C), and

(b) petroleum, including crude oil or any fraction thereof that is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

The term regulated substance includes but is not limited to petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil though processes of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Release means any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an UST into groundwater, surface water or subsurface soils.

Release Detection means determining whether a release of a regulated substance has occurred from the UST system into the environment or into the interstitial space between the UST system and its secondary barrier or secondary containment around it.

Repair means to restore a tank or UST system component that has caused a release of product from the UST system.

Residential Tank is a tank located on property used primarily for dwelling purposes.

Septic Tank is a water-tight covered receptacle designed to receive or process, through liquid separation or biological digestion, the sewage discharged from a building sewer. The effluent from such receptacle is distributed for disposal through the soil and settled solids and scum from the tank are pumped out periodically and hauled to a treatment facility.

Storm-Water Or Wastewater Collection System means piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

Tank is a stationary device designed to contain an accumulation of regulated substances and constructed of non-earthen materials (e.g., concrete, steel, plastic) that provide structural support.

Underground Storage Tank or **UST** means any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground. This term does not include any:

(a) Farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;

(b) Tank used for storing heating oil for consumptive use on the premises where stored;

(c) Septic tank;

(d) Pipeline facility (including gathering lines) regulated under:

(1) The Natural Gas Pipeline Safety Act of 1968 (49 U.S.C. App. 1671, et seq.), or

(2) The Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. App. 2001, et seq.), or

(3) Which is an intrastate pipeline facility regulated under state laws comparable to the provisions of the law referred to in paragraph (d)(1) or (d)(2) of this definition;

(e) Surface impoundment, pit, pond, or lagoon;

(f) Storm-water or wastewater collection system;

(g) Flow-through process tank;

(h) Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or

(i) Storage tank situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

The term underground storage tank or UST does not include any pipes connected to any tank which is described in paragraphs (a) through (i) of this definition.

Upgrade means the addition or retrofit of some systems such as cathodic protection, lining, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of product.

UST System or **Tank System** means an underground storage tank, connected underground piping, underground ancillary equipment, and containment system, if any.

Wastewater Treatment Tank means a tank designed to receive and treat an influent wastewater through physical, chemical, or biological methods.

Definitions Developed or Gathered for this Manual and Not Listed in the Federal Regulations

Coating means a layer of dielectric material (a material that does not conduct direct electrical current) that is applied to the outside wall of steel tanks and piping.

Compliance means that a facility meets the minimum requirements as stated in the regulations.

Corrective Action means activities associated with cleaning up a site where a release to the environment has occurred.

Corrosion means the degradation of a material due to a reaction with its environment. An example of corrosion is the rusting of steel.

Empty means that all materials have been removed using commonly employed practices so that no more than 2.5 centimeters (one inch) of residue (including product, water, sludge, etc.), or 0.3 percent by weight of the total tank capacity of the UST system, remain in the system.

Field Constructed Tank is a tank that was not constructed or built in a factory, but rather, constructed or built in the field (such as at the location where it was installed). For example, very large tanks may be field constructed.

Fill Pipe is the pipe that extends from the surface to the tank that is used for filling the tank with substances.

Financial Responsibility is the ability to pay for cleanup or third-party liability compensation.

Non-corrodible material means a material that will not corrode or degrade in the environment where it is placed. For example, fiberglass material in the soil.

Non-marketing facility means a facility that does not sell or transfer petroleum to the public or any other facility that would sell the petroleum. Additionally, non-marketing facilities do not produce or refine petroleum. An example of a non-marketer is a bus terminal.

Pressurized Delivery is a delivery where product is pumped from the delivery truck to the tank.

Secondary Containment is an additional barrier between the part of the tank or piping that contains product and the outside environment. Examples of secondary containment are double-walled tanks and piping, tank bladders, tank jackets, and excavation liners.

Stage I Vapor Recovery is a system that captures the vapors expelled from an underground storage tank as a result of being filled by a delivery truck. There are two primary types – coaxial and two point. Coaxial Stage I vapor recovery is two concentric channels, one inside of the other. The inner channel conveys product from the delivery truck to the tank while the outer channel conveys vapors from the tank to the delivery truck. Two point Stage I vapor recovery uses two separate connections, one to deliver product to the tank and the other to deliver vapors to the delivery truck.

Sump means an underground area such as a hole or pit that is used to house equipment. Sumps may or not be contained.

(a) in the case of a turbine sump, it is an area above the tank over which a cover is placed that houses the submersible turbine pump head, line leak detector, piping and other equipment.

(b) In the case of a dispenser sump, it is the area beneath a dispenser that houses piping and other equipment.